APPENDIX A – STREAM RESTORATION PLAN TAFT AVENUE APPROVED PLAN DSP2007-00018

STREAM RESTORATION PLAN

TAFT AVENUE

CITY OF ALEXANDRIA, VIRGINIA

Released 4/16/08 SMB

CLIENT

CALVERT DEVELOPMENT
12656-C LAKE RIDGE DRIVE
LAKE RIDGE, VIRGINIA 22192
(703) 643-5001
(703) 643-2863 FAX
ATTN: MR. DAVE FARMER

ENGINEER

WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
5209 CENTER STREET
WILLIAMSBURG, VIRGINIA 23188
(757) 220-6869
(757) 229-4507 FAX
ATTN: JEFFREY T. HANCOCK, P.E.

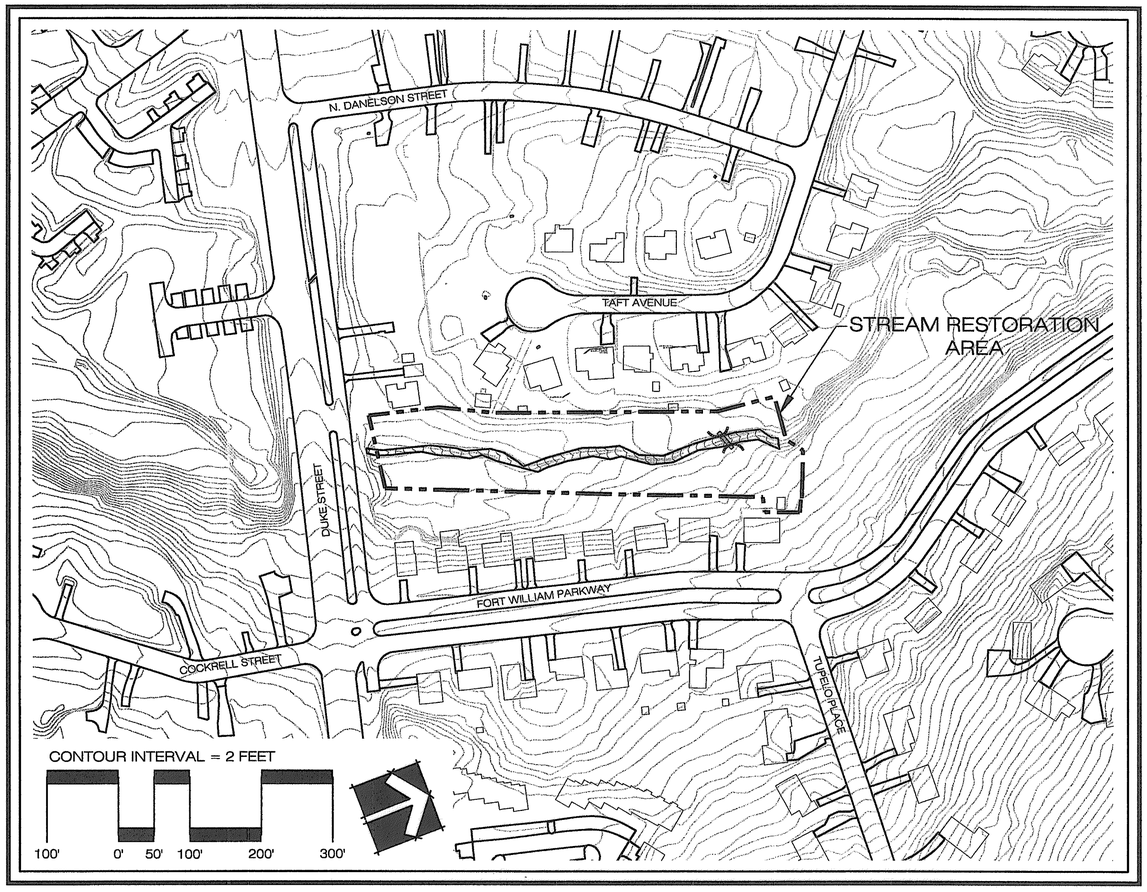
TOPOGRAPHY

BASE MAPPING PROVIDED BY
LAND DESIGN CONSULTANTS

BENCHMARK

NORTHING - 6981107.54
EASTING - 11883174.60
ELEVATION - 79.71 MSL
DESCRIPTION - BENCHMARK IS LOCATED AT UPSTREAM CULVERT INVERT UNDER DUKE STREET

THE NORTHING AND EASTING PROVIDED ARE BASED OFF OF THE COORDINATED PLANE NAD STATE PLANE NORTH 1983.



U.S. ARMY CORPS OF ENGINEERS PERMIT # 05 - R1109

PROJECT NARRATIVE:

THE CONSTRUCTION PLANS PROPOSE APPROXIMATELY 600 LINEAR FEET OF STREAM RESTORATION AS COMPENSATION FOR THE PROPOSED PERMANENT RESOURCE PROTECTION AREA (RPA) BUFFER AND STORMWATER QUALITY IMPACTS ASSOCIATED WITH THE TAFT AVENUE DEVELOPMENT.

STRAWBERRY RUN, A TRIBUTARY TO CAMERON RUN, IS LOCATED BETWEEN TAFT AVENUE AND FORT WILLIAMS PARKWAY, PERPENDICULAR TO DUKE STREET IN THE CITY OF ALEXANDRIA. THE AREA OF STRAWBERRY RUN AT THE PROJECT LOCATION IS ALSO IDENTIFIED AS FORT WILLIAMS PARK. STRAWBERRY RUN DRAINS 138 ACRES OF A PRIMARILY RESIDENTIAL WATERSHED BEFORE ENTERING A 88" CULVERT UNDER DUKE STREET.

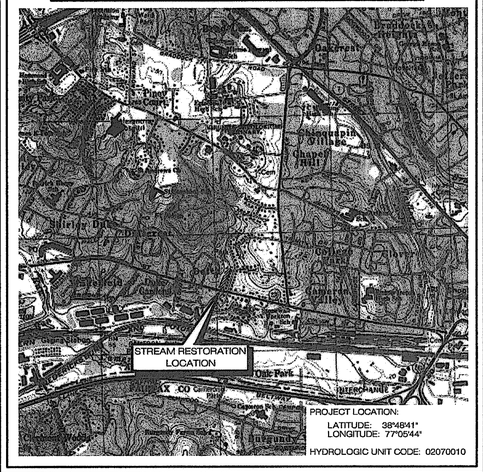
THE UPSTREAM PORTION OF THE CHANNEL IS SEVERELY INCISED, EXHIBITING VERTICAL BANKS AND MINIMAL CONNECTIVITY TO THE FLOODPLAIN. ALTHOUGH THE DOWNSTREAM PORTION OF THE STREAM IS LESS INCISED, BANK EROSION AND SCOUR CONTINUE TO DEMONSTRATE THE OVERALL INSTABILITY OF THE CHANNEL. BANK EROSION HAS UNDERMINED THE INTEGRITY OF AN EXISTING STORMWATER INFLOW PIPE, IN ADDITION TO A WOODEN FOOT BRIDGE. CONCRETE DEBRIS WITHIN THE CHANNEL DISRUPTS NATURAL FLOW DYNAMICS. THE EXISTING RIPARIAN CORRIDOR IS PRIMARILY COMPRISED OF MAINTAINED GRASS AND SCATTERED MATURE HARDWOODS, WITH OCCASIONAL NON-NATIVE SPECIES. MINIMAL HERBACEOUS VEGETATION ON THE STREAM BANKS CONTRIBUTES TO FURTHER DEGRADATION WITHIN THE CHANNEL.

THE PROPOSED RESTORATION COMBINES IN-STREAM STRUCTURES WITH BANK STABILIZATION TECHNIQUES. IN-STREAM STRUCTURES WILL ALSO BE UTILIZED TO DIVERT EROSIVE FLOWS FROM OUTER BENDS INTO THE CENTER OF THE CHANNEL AND CREATE IN-STREAM HABITAT. ROCK TOE PROTECTION SHALL PROVIDE ADDITIONAL PROTECTION IN HIGH STRESS AREAS ALONG THE STREAM CHANNEL. THE EXISTING CONCRETE DEBRIS SHALL BE REMOVED TO RESTORE NATURAL FLOW DYNAMICS. VEGETATED BANKFULL BENCHES WILL INCREASE CONNECTIVITY TO THE FLOODPLAIN AND PROVIDE CHANNEL CAPACITY.

AS PROPOSED MITIGATION FOR RPA IMPACTS, THE RESTORATION PLAN INCORPORATES 1.3 ACRES OF RIPARIAN CORRIDOR RESTORATION. NON-NATIVE VEGETATION (E.G., BAMBOO) SHALL BE MANAGED AND NATIVE VEGETATION SHALL BE USED TO RESTORE THE RIPARIAN BUFFER.

SHEET INDEX:

VICINITY MAP: 1" = 2000'



COMMONWEALTH OF VIRGINIA
JEFFREY T. HANCOCK
Lic. No. 37017
01/16/2008
PROFESSIONAL ENGINEER

DATE: 12/27/05
FIRST SUBMITTAL

REVISIONS:

DATE		DATE	
5/26/06	SECOND SUBMITTAL	10/11/07	PER 9/17/07 REVIEW LETTER - CITY STAFF COMMENTS
12/18/06	THIRD SUBMITTAL - ADJUSTED PER COUNTY COMMENTS	01/11/08	PER CITY COMMENT
04/12/07	PER 02/26/07 REVIEW LETTER - CITY STAFF COMMENTS		
8/14/07	PER 6/27/07 REVIEW LETTER - CITY STAFF COMMENTS		

APPROVED
SPECIAL USE PERMIT NO. DSP 2007 - 0018
DEPARTMENT OF PLANNING & ZONING
DIRECTOR — DATE 2.4.08
DEPARTMENT OF TRANSPORTATION & ENVIRONMENTAL SERVICES
SITE PLAN NO. 2007-0018
DIRECTOR — DATE 2/1/08
CHAIRMAN, PLANNING COMMISION — DATE 2/4/08
DATE RECORDED
INSTRUMENT NO. DEED BOOK NO. PAGE NO.

Released 4/16/08 SMB

WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
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5705 Salem Run Blvd., Suite 105, Fredericksburg, Virginia 22407, (540)785-5544
Environmental Consultants

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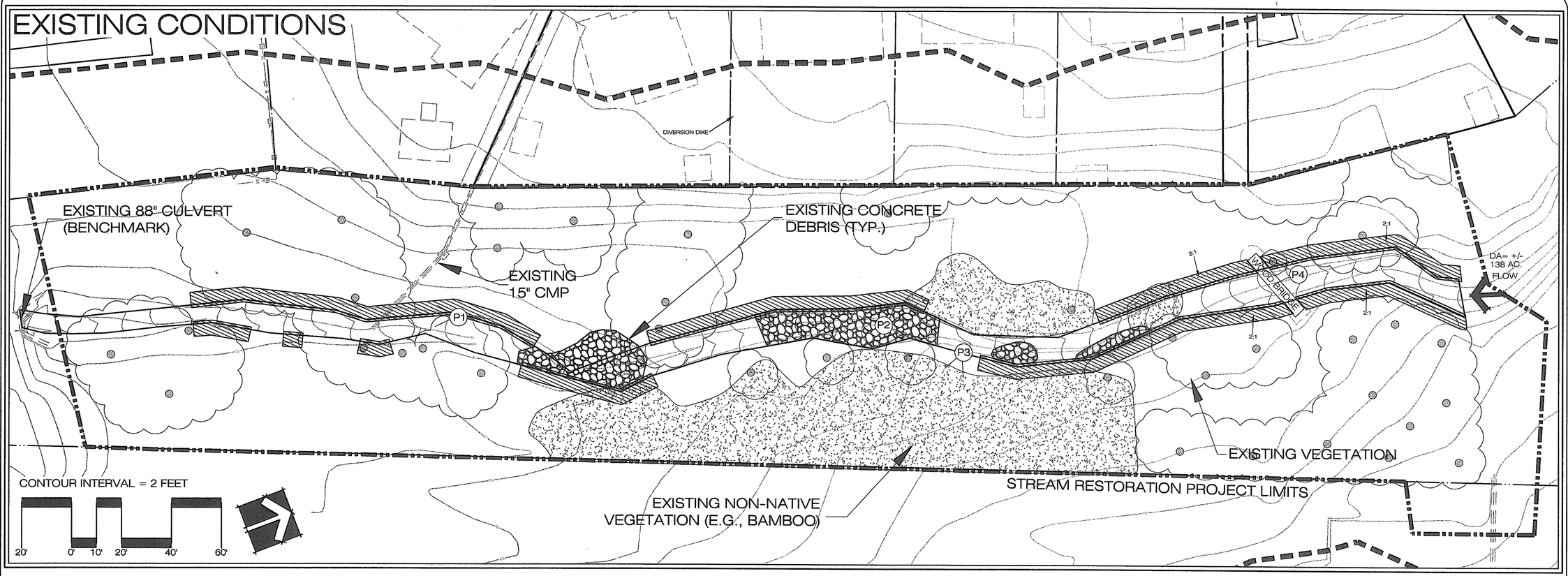
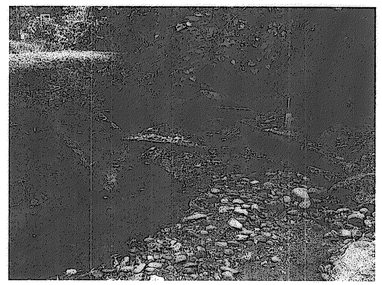
EXISTING CONDITIONS



EXISTING CONDITIONS SUMMARY

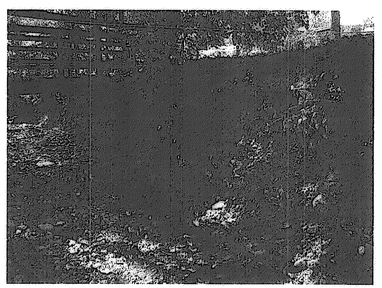
STRAWBERRY RUN DISPLAYS VARIOUS FORMS OF DEGRADATION AND CHANNEL INSTABILITY. PORTIONS OF THE CHANNEL ARE SEVERELY INCISED, EXHIBITING VERTICAL BANKS AND MINIMAL CONNECTIVITY TO THE FLOODPLAIN. THE BANKS LACK VEGETATIVE PROTECTION AND, DUE TO AN INEFFECTIVE ROOTING DEPTH, DEMONSTRATE SIGNS OF INSTABILITY. BANK EROSION HAS UNDERMINED THE INTEGRITY OF AN EXISTING 15" CMP, CONTRIBUTING TO DOWNSTREAM CHANNEL INSTABILITY. THE EXISTING WOODEN FOOT BRIDGE CROSSES A SEVERELY ERODED PORTION OF THE STREAM CHANNEL. CONCRETE DEBRIS ALONG THE STREAM BED PROHIBITS NATURAL FLOW DYNAMICS AND CONTRIBUTES TO SEDIMENT DEPOSITION. THE EXISTING RIPARIAN CORRIDOR PROVIDES LIMITED WILDLIFE HABITAT AND IS COMPRISED OF MAINTAINED GRASSES AND SCATTERED MATURE HARDWOODS. PORTIONS OF THE BUFFER ARE DOMINATED BY NON-NATIVE SPECIES, INCLUDING BAMBOO (SEE PHOTO 3), AND INVASIVE SPECIES, INCLUDING VIRGINIA CREEPER.

PHOTOGRAPH 1: UNSTABLE/ERODING BANKS ALONG OUTER BENDS OF CHANNEL AND EXISTING 15" CMP.



PHOTOGRAPH 2: EXISTING CONCRETE SPOIL SCATTERED IN AND ALONG THE STREAM CORRIDOR.

PHOTOGRAPH 3: EXISTING NON-NATIVE VEGETATION TO BE REMOVED DURING RESTORATION EFFORTS.



PHOTOGRAPH 4: VERTICAL BANKS LACK VEGETATIVE PROTECTION NEAR FOOT BRIDGE.

LEGEND:

- PROJECT LIMITS
- APPROXIMATE STREAM CHANNEL LIMITS
- EXISTING BUILDINGS
- EXISTING CONTOURS
- RESOURCE PROTECTION AREA LIMITS
- EXISTING TREE AND DRIP LINE
- EXISTING BANK EROSION
- EXISTING NON-NATIVE VEGETATION
- EXISTING CONCRETE DEBRIS
- P1 PHOTOGRAPH LOCATION

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7501 Boulders View Drive, Suite 205, Richmond, Virginia 23225, (804) 267-3474
3703 Salem Run Blvd, Suite 105, Fredericksburg, Virginia 22407, (540)785-5544

EXISTING CONDITIONS
TAFT AVENUE
CITY OF ALEXANDRIA, VIRGINIA

COMMONWEALTH OF VIRGINIA
JEFFREY T. HANCOCK
Lic. No. 37017
01/16/2008
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
04/12/07	BRIDGE RETAINED
8/14/07	PER 6/27/07 CITY REVIEW LETTER

DRAWN BY: EBG/MAM
DESIGNED BY: TWC/EBG/NJL
DATE: 12/27/06
CHECKED BY: TWC/JTH

SHEET: 2
JOB#: 2256

APPROVED
SPECIAL USE PERMIT NO. 2007-0018
DEPARTMENT OF PLANNING & ZONING
DIRECTOR — DATE 2.4.08
DEPARTMENT OF TRANSPORTATION & ENVIRONMENTAL SERVICES
SITE PLAN NO. 2007-0018
DIRECTOR — DATE 2/1/08
CHAIRMAN, PLANNING COMMISSION — DATE 2/4/08
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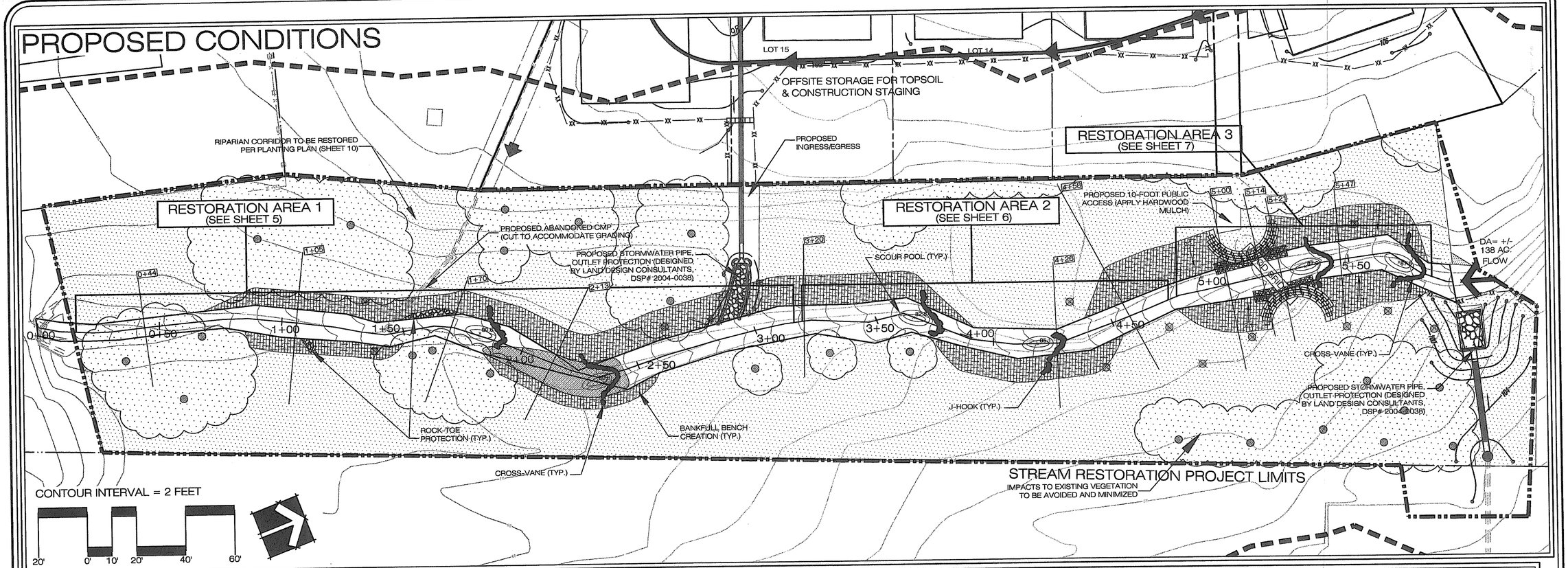
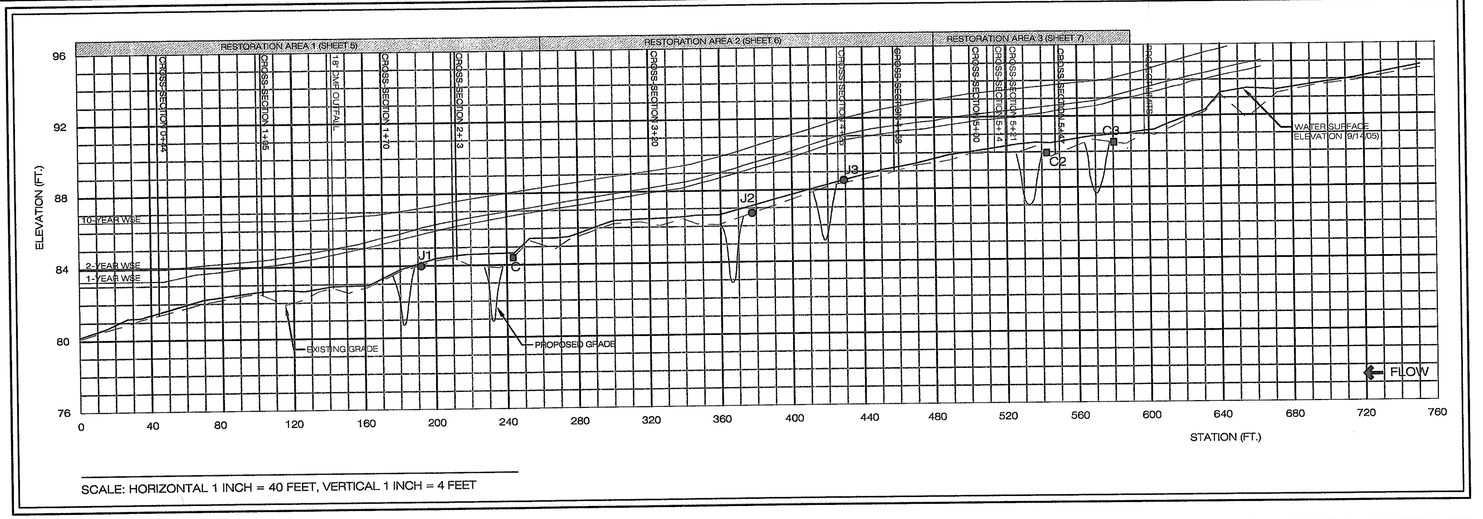
PROPOSED CONDITIONS



LEGEND:

- PROJECT LIMITS
- APPROXIMATE STREAM CHANNEL LIMITS
- RESOURCE PROTECTION AREA LIMITS
- EXISTING CONTOURS
- EXISTING TREES (TO BE PROTECTED)
- EXISTING TREES (TO BE REMOVED)
- PROPOSED CROSS-VANE
- PROPOSED J-HOOK
- PROPOSED SCOUR POOL
- PROPOSED BUFFER RESTORATION AREA
- PROPOSED BANKFULL BENCH AND BANK GRADING
- PROPOSED GRADING FOR STORMWATER OUTFALL (BY OTHERS)
- UN-SURVEYED CROSS-SECTION (1+26)
- SURVEYED CROSS-SECTION (0+44)
- PROPOSED ROCK STABILIZATION
- PROPOSED OUTLET PROTECTION
- PROPOSED CHANNEL SHAPING
- PROPOSED BRIDGE STABILIZATION



SCALE: HORIZONTAL 1 INCH = 40 FEET, VERTICAL 1 INCH = 4 FEET

PROPOSED RESTORATION SUMMARY

THE PROPOSED RESTORATION WITHIN STRAWBERRY RUN COMBINES IN-STREAM STRUCTURES WITH CHANNEL SHAPING AND BANK STABILIZATION TECHNIQUES. EXISTING CONCRETE DEBRIS WILL BE REMOVED FROM THE STREAM BED AND BANKS IN ORDER TO RESTORE NATURAL FLOW DYNAMICS. IN-STREAM STRUCTURES, INCLUDING J-HOOKS, AND CROSS-VANES, SHALL PROVIDE GRADE CONTROL AND DIVERT EROSIVE FLOWS FROM OUTER BENDS. OUTLET PROTECTION AT THE PROPOSED 18" CMP WILL ATTENUATE STORMWATER FLOWS AND PREVENT FURTHER DEGRADATION OF THE DOWNSTREAM STREAM BANKS. ROCK-TOE PROTECTION WILL PROTECT THE CONFLUENCE OF THE CHANNEL AND AN EXISTING DRAINAGE SWALE, IN ADDITION TO STABILIZING HIGH STRESS AREAS. BANKFULL BENCHES SHALL PROVIDE SLOPE STABILIZATION IN EXISTING ERODED AREAS, WHERE PRACTICABLE, IN ADDITION TO ENHANCING CONNECTIVITY TO THE FLOODPLAIN. THE EXISTING WOOD FOOT BRIDGE WILL BE RETAINED AND ENHANCED WITH A PROPOSED CONCRETE FOUNDATION. PROPOSED ROCK STABILIZATION, ROCK-TOE PROTECTION, AND CEMENT GROUTED RIPRAP WILL PROTECT THE EXISTING VERTICAL BANKS NEAR THE BRIDGE DURING HIGH FLOW EVENTS.

THE RESTORATION PLAN ALSO INCORPORATES APPROXIMATELY 1.3 ACRES OF RIPARIAN CORRIDOR RESTORATION. NON-NATIVE VEGETATION (E.G., BAMBOO) SHALL BE MANAGED AND NATIVE VEGETATION SHALL BE USED TO RESTORE THE RIPARIAN BUFFER. IMPACTS TO EXISTING MATURE TREES SHALL BE AVOIDED AND MINIMIZED. TREES, SHRUBS, LIVE-STAKES, AND A HERBACEOUS SEED MIX SHALL PROVIDE AN EFFECTIVE ROOTING DEPTH TO STABILIZE THE GRADED BANKS.

PROPOSED DESIGN GUIDELINES

THE PROPOSED DESIGN SHALL MIMIC, TO THE CLOSEST EXTENT PRACTICABLE, THE "C" CHANNEL PARAMETERS OUTLINED BY THE ROSGEN CLASSIFICATION METHOD. THE PARAMETERS INCLUDE ENTRENCHMENT RATIO, WIDTH/DEPTH RATIO, SINUOSITY, AND SLOPE. AN AVERAGE OF EXISTING CONDITIONS AND PROPOSED CONDITIONS IS PRESENTED BELOW.

	ENTRENCHMENT RATIO	WIDTH/DEPTH RATIO	SINUOSITY	SLOPE
"C" CHANNEL GUIDELINES	>2.2	>12	>1.2	<.02
EXISTING CONDITION	1.5 - >2.2	10.6*	1.03	.02
PROPOSED CONDITION	1.9 - >2.2	16.5*	1.03	.02

* WIDTH-DEPTH RATIO CALCULATED AS TOP WIDTH DIVIDED BY AVERAGE DEPTH

- J1 — J-HOOK (1-3)
- C1 — CROSS-VANE (1-3)
- WSE — WATER SURFACE ELEVATION

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7501 Bufallow View Drive, Suite 200, Richmond, Virginia 23225, (804) 267-3474

MASTER PLAN
TAFT AVENUE
CITY OF ALEXANDRIA, VIRGINIA

COMMONWEALTH OF VIRGINIA
JEFFREY T. HANCOCK
Lic. No. 37017
01/14/2008
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
05/22/06	REVISED BUFFER REVEGETATION
05/22/06	TO REFLECT EASEMENTS
05/22/06	REMOVED EXISTING 12' STORM-WATER PIPE AND OUTLET PROTECTION
12/18/06	UPDATED LONGITUDINAL PROFILE
12/18/06	REMOVED BRIDGE, EXTENDED BANKFULL BENCH
04/12/07	BRIDGE RETAINED
9/14/07	PER 8/24/07 CITY REVIEW LETTER
10/31/07	PER 9/17/07 CITY REVIEW LETTER
11/26/07	PER 11/06/07 CITY COMMENT
2/17/08	PER CITY COMMENT

DRAWN BY: EBG/MAM
DESIGNED BY: TWC/EBG/NJL
DATE: 12/27/05
CHECKED BY: TWC/JTH

SHEET: 3
JOB#: 2256

APPROVED
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DEPARTMENT OF PLANNING & ZONING
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CHAIRMAN, PLANNING COMMISSION — DATE 2/14/08
DATE RECORDED ____

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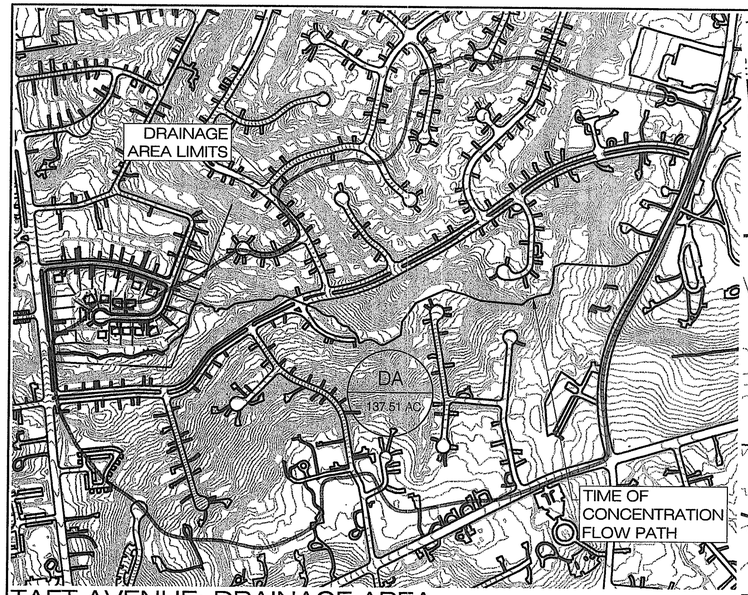
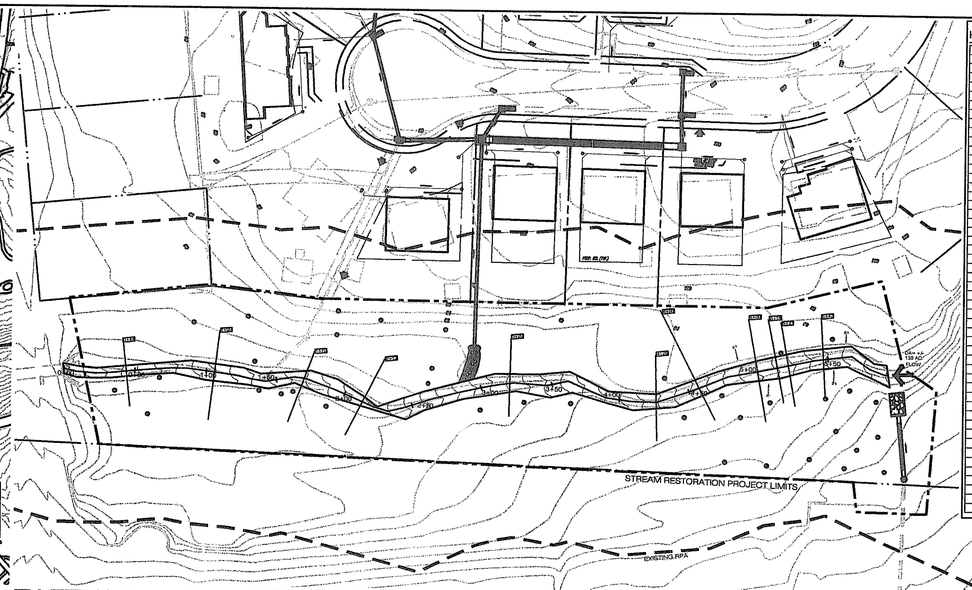
DSP 2007-0018



TAFT AVENUE: DRAINAGE AREA

SCALE: 1 INCH = 500 FEET



TAFT AVENUE: HYDROLOGIC AND HYDRAULIC SUMMARY

SCALE: 1 INCH = 50 FEET

HYDRAULIC SUMMARY

River Sta	Profile	Plan	Q Total (cfs)	W.S. Elev (ft)	Vel Chnl (ft/s)	Shear Chan (lb/sq ft)	Power Chan (lb/ft s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
547.00	1-YR	EXISTING	110.00	92.49	5.51	1.75	9.27	20.72	11.69	0.76
547.00	1-YR	PROPOSED	110.00	92.22	5.06	1.63	8.27	22.56	16.63	0.75
547.00	2-YR	EXISTING	150.00	92.88	5.96	2.11	12.56	25.15	12.01	0.73
547.00	2-YR	PROPOSED	150.00	92.60	5.34	1.68	8.98	30.49	21.33	0.70
521.00	1-YR	EXISTING	110.00	92.27	3.99	0.99	3.49	30.65	15.12	0.44
521.00	1-YR	PROPOSED	110.00	92.08	3.94	0.41	1.61	27.92	14.66	0.51
521.00	2-YR	EXISTING	150.00	92.66	4.08	0.86	3.50	36.78	15.69	0.47
521.00	2-YR	PROPOSED	150.00	92.43	4.52	0.61	2.30	33.21	15.38	0.54
514.00	1-YR	EXISTING	110.00	92.14	3.82	0.80	3.04	28.80	14.95	0.48
514.00	1-YR	PROPOSED	110.00	92.01	4.11	0.45	1.85	26.76	14.75	0.54
514.00	2-YR	EXISTING	150.00	92.63	4.33	0.98	4.24	34.56	15.50	0.51
514.00	2-YR	PROPOSED	150.00	92.34	4.72	0.56	2.65	31.81	15.43	0.58
500.00	1-YR	EXISTING	110.00	91.96	4.33	1.06	4.59	25.38	14.62	0.59
500.00	1-YR	PROPOSED	110.00	91.90	3.94	0.87	3.44	29.63	22.90	0.55
500.00	2-YR	EXISTING	150.00	92.33	4.66	1.27	6.16	30.87	15.15	0.60
500.00	2-YR	PROPOSED	150.00	92.26	4.32	0.58	4.35	38.00	24.33	0.54
458.00	1-YR	EXISTING	110.00	91.36	4.04	0.97	3.91	27.25	14.53	0.52
458.00	1-YR	PROPOSED	110.00	91.35	3.96	0.93	3.67	28.60	17.78	0.51
458.00	2-YR	EXISTING	150.00	91.69	4.64	1.24	5.78	32.30	15.67	0.57
458.00	2-YR	PROPOSED	150.00	91.70	4.49	1.14	5.11	35.15	19.32	0.54
320.00	1-YR	EXISTING	110.00	87.82	5.66	1.98	11.13	19.42	14.87	0.67
320.00	1-YR	PROPOSED	110.00	88.02	4.54	1.21	5.49	24.66	19.98	0.67
320.00	2-YR	EXISTING	150.00	88.09	6.35	2.39	15.00	23.61	15.60	0.91
320.00	2-YR	PROPOSED	150.00	88.32	5.05	1.42	7.20	31.08	21.25	0.69
213.00	1-YR	EXISTING	110.00	86.12	3.80	0.74	2.59	31.40	23.65	0.54
213.00	1-YR	PROPOSED	110.00	86.33	3.74	1.64	6.12	33.89	28.48	0.50
213.00	2-YR	EXISTING	150.00	86.45	3.73	0.79	2.93	40.20	24.64	0.51
213.00	2-YR	PROPOSED	150.00	86.65	4.12	1.88	7.74	43.19	29.79	0.51
170.00	1-YR	EXISTING	110.00	85.40	4.61	1.24	5.73	23.86	14.84	0.64
170.00	1-YR	PROPOSED	110.00	85.32	4.02	1.99	7.99	28.10	20.62	0.57
170.00	2-YR	EXISTING	150.00	85.76	5.10	1.45	7.41	29.42	15.78	0.68
170.00	2-YR	PROPOSED	150.00	85.65	4.43	2.29	10.16	35.19	22.00	0.59
105.00	1-YR	EXISTING	110.00	84.29	4.91	1.37	6.71	22.67	15.98	0.65
105.00	1-YR	PROPOSED	110.00	84.16	4.39	1.09	4.77	25.39	17.20	0.60
105.00	2-YR	EXISTING	150.00	84.63	5.52	1.64	9.06	29.87	26.51	0.67
105.00	2-YR	PROPOSED	150.00	84.50	4.92	1.29	6.35	32.64	27.51	0.61
44.00	1-YR	EXISTING	110.00	83.29	4.45	1.36	6.07	24.71	21.40	0.73
44.00	1-YR	PROPOSED	110.00	83.29	4.45	1.36	6.07	24.72	21.40	0.73
44.00	2-YR	EXISTING	150.00	83.97	3.72	0.82	3.05	44.78	40.49	0.49
44.00	2-YR	PROPOSED	150.00	83.97	3.72	0.82	3.06	44.77	40.48	0.49

CONTOUR INTERVAL = 2 FEET

50' 0' 25' 50' 100' 150'

HYDROLOGIC SUMMARY

HYDROLOGIC ANALYSIS

HYDROLOGIC ANALYSES WERE PERFORMED FOR STRAWBERRY RUN, A TRIBUTARY TO CAMERON RUN, NORTH OF VA STATE RTE 236 AND SOUTH OF INTERSTATE 395 IN THE CITY OF ALEXANDRIA, VIRGINIA, IN ORDER TO DETERMINE RUNOFF CHARACTERISTICS DURING VARIOUS STORM EVENTS, AS WELL AS TO DETERMINE DISCHARGES THAT ARE ASSOCIATED WITH BANKFULL ELEVATIONS.

THE DRAINAGE AREA SUPPLYING THE STRAWBERRY RUN TRIBUTARY WAS DELINEATED USING 2 FOOT DIGITAL TOPOGRAPHY AND CURRENT AERIAL PHOTOS WITH A RESULTANT TOTAL DRAINAGE AREA OF 137.51 ACRES.

PEAK FLOWS FOR VARIOUS RECURRENCE INTERVALS WERE DEVELOPED USING THE NATURAL RESOURCES CONSERVATION SERVICE (FORMERLY SCS) METHODOLOGY AND RUNOFF PROCEDURES AS IMPLEMENTED IN PONDPACK MODELING SOFTWARE BY HAESTAD METHODS.

THE FLOWS USED FOR THE VARIOUS DESIGN STORM EVENTS ARE SUMMARIZED IN THE HYDROLOGIC SUMMARY TABLE.

WEG EVALUATED THE 1 AND 2 YEAR STORM EVENTS FOR PEAK DISCHARGE RATES. THESE DESIGN STORM EVENTS WERE THEN INPUT INTO THE US ARMY CORPS OF ENGINEERS 'HEC-RAS: RIVER ANALYSIS SYSTEM' IN ORDER TO DETERMINE BASELINE FLOW RATES, BOUNDARY CONDITIONS AND FLOW PARAMETERS THAT WERE USED IN THE STREAM RESTORATION DESIGN.

MODEL INPUT DATA

WATERSHED	AREA (AC)	CN	Tc (HR)
TAFT AVE.	137.51	82	0.65

HYDROLOGIC SUMMARY

STORM EVENT (YR)	RAINFALL (IN)	PEAK DISCHARGE (CFS)
1	2.7	109.76
2	3.2	149.15

HYDRAULIC SUMMARY

HYDRAULIC ANALYSIS

HYDRAULIC ANALYSIS OF STRAWBERRY RUN, A TRIBUTARY TO CAMERON RUN, WAS PERFORMED USING THE USACE HEC-RAS PROGRAM TO DETERMINE THE STORM MAGNITUDE AND RECURRENCE INTERVAL CAUSING OVER-BANK FLOODING AT DIFFERENT CROSS-SECTIONS, AS WELL AS AREAS OF HIGH SHEAR STRESS AND STREAM POWER THAT INDICATE AREAS WHERE STREAM RESTORATION TECHNIQUES AND BANK STABILIZATION ARE NEEDED.

CROSS SECTIONS WERE DEVELOPED FROM EXISTING 2-FOOT DIGITAL TOPOGRAPHY WHICH WAS SUPPLEMENTED WITH CROSS SECTIONS SURVEYED BY WEG USING A TOPCON LASER LEVEL. THESE CROSS SECTIONS DESCRIBE THE CHANNEL GEOMETRY AS WELL AS THE OVERBANK FLOODPLAIN AREAS.

MANNING'S COEFFICIENTS FOR EXISTING CONDITIONS WERE DETERMINED FROM PHOTO DOCUMENTATION AND HEC-RAS TABLES FOR CHANNELS WITH COBBLES, STONES, AND SOME VEGETATION (0.048 - 0.05) AND FLOODPLAINS WITH MEDIUM TO DENSE BRUSH (0.01). FOR PROPOSED CONDITIONS, MANNING'S COEFFICIENTS WERE ADJUSTED, FROM 0.048-0.05 TO 0.07, IN REACHES WHERE CROSS VANES, PLUNGE POOLS, AND J-HOOKS ARE PROPOSED TO EFFECTIVELY MODEL THE PROPOSED STREAM RESTORATION TECHNIQUES.

THE HYDRAULIC ANALYSIS WAS USED TO DETERMINE THE OVERALL CONVEYANCE CAPACITY CHARACTERISTICS OF THE PRIMARY, AND BANKFULL BENCH ELEVATIONS THAT WOULD ALLOW FLOW CONVEYANCE DURING LARGER STORM EVENTS.

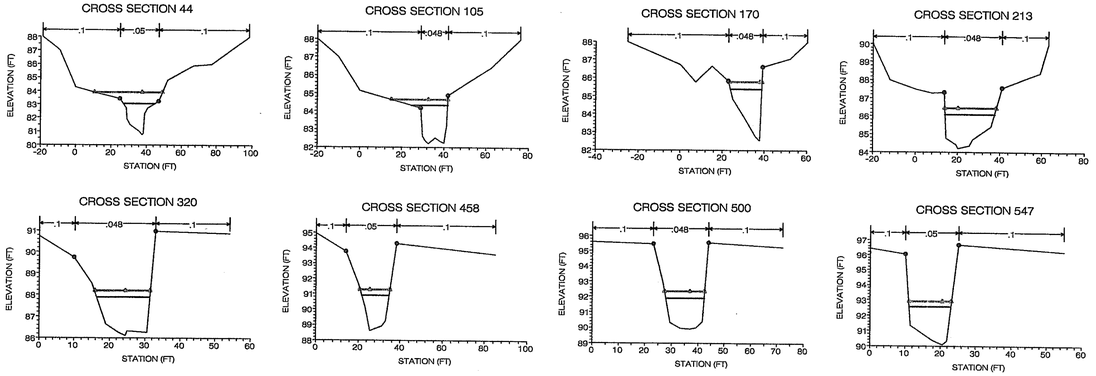
THE FLOW CHARACTERISTICS GENERATED BY THIS ANALYSIS ARE SUMMARIZED IN THE HYDRAULIC SUMMARY TABLE.

MODELING INDICATED THAT WITH EXISTING CONDITIONS CHANNEL GEOMETRY, OVER-BANK FLOODING DOES NOT OCCUR FOR SMALLER RECURRENCE INTERVALS (1-YR STORM AND 2-YR. STORM).

THE RESULTS OF THE MODEL INDICATE THAT BANKFULL WIDTH AND DEPTH MEASUREMENTS DERIVED FROM THE GEOMORPHIC ASSESSMENT (FIELD INDICATORS) OF THE STREAM ARE GENERALLY CONSISTENT WITH THE MODELED WATER SURFACE ELEVATIONS FOR THE 1-YEAR STORM EVENT (CHANNEL FORMING FLOW).

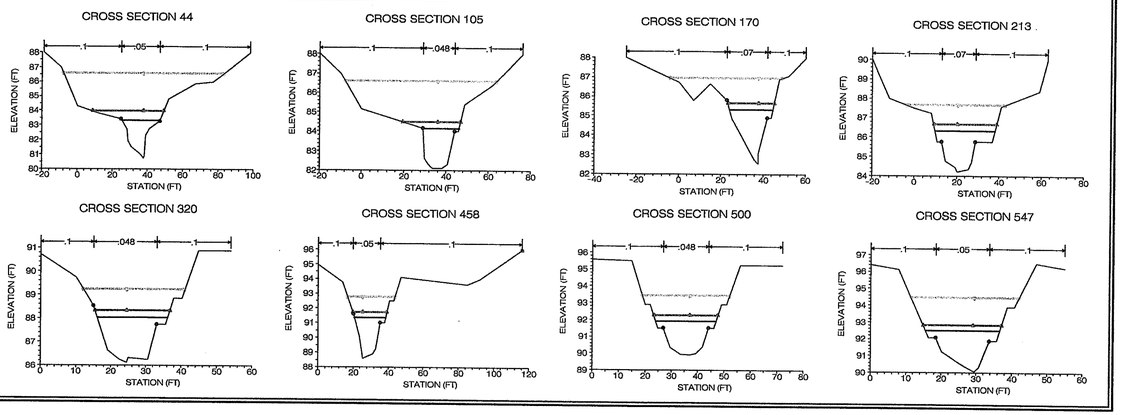
EXISTING CONDITIONS

2-YR EXISTING WSE
1-YR EXISTING WSE



PROPOSED CONDITIONS

10-YR PROPOSED WSE
2-YR PROPOSED WSE
1-YR PROPOSED WSE



LEGEND:

- PROJECT LIMITS
- APPROXIMATE STREAM CHANNEL LIMITS
- EXISTING CONTOURS
- EXISTING BUILDING (TYP)
- EXISTING TREE AND DRIP LINE
- EXISTING 88" CULVERT (DUKE STREET)
- EXISTING STORMWATER PIPE/OUTFALL
- PROPOSED STORMWATER PIPE/OUTFALL
- PROPOSED GRADING
- PROPOSED BUILDING (TYP.)
- RESOURCE PROTECTION AREA LIMITS
- 1+26 UN-SURVEYED CROSS-SECTION LOCATION
- 0+44 SURVEYED CROSS-SECTION LOCATION
- 4+00 STREAM PROFILE (TYP)

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HYDROLOGIC AND HYDRAULIC SUMMARY
TAFT AVENUE
CITY OF ALEXANDRIA, VIRGINIA

COMMONWEALTH OF VIRGINIA
COURTEY T. HANCOCK
Lic. No. 37017
01/14/2008
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
12/18/06	UPDATED HYDRAULIC SUMMARY FOR SCENARIO WITHOUT BRIDGE
04/12/07	BRIDGE RETAINED
8/14/07	PER 6/27/07 CITY REVIEW LETTER

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DESIGNED BY: TWC/ESG/NJL
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SHEET: 4
JOB#: 2256

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DEPARTMENT OF PLANNING & ZONING
DIRECTOR — DATE 2.4.08
DEPARTMENT OF TRANSPORTATION & ENVIRONMENTAL SERVICES
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DIRECTOR — DATE 2/1/08
CHAIRMAN, PLANNING COMMISSION — DATE 2/4/08
DATE RECORDED
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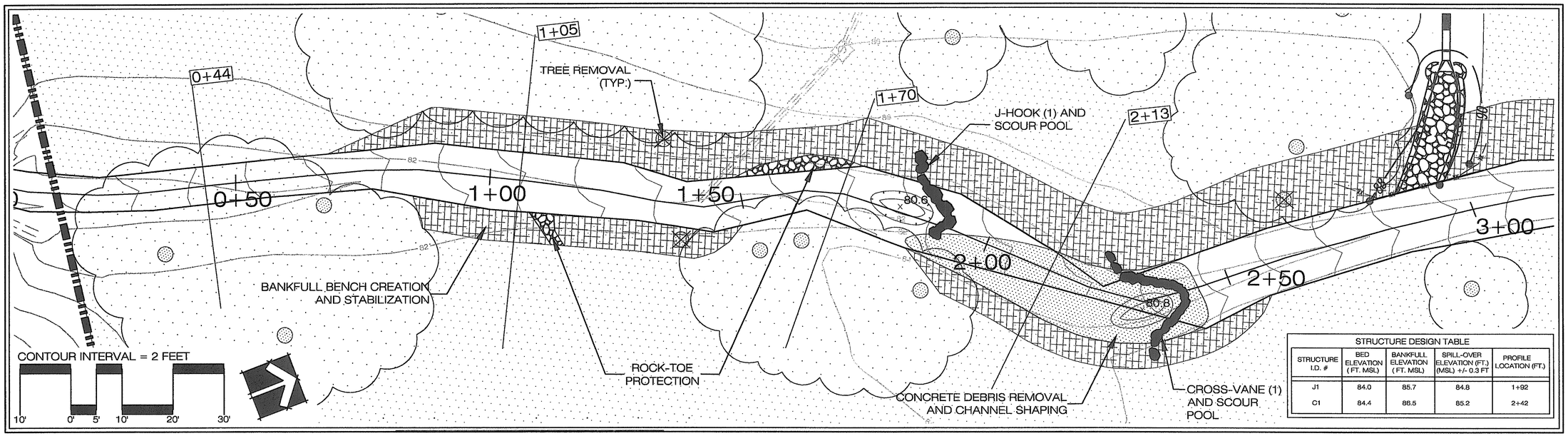


STRUCTURE DESIGN TABLE

STRUCTURE I.D. #	BED ELEVATION (FT. MSL)	BANKFULL ELEVATION (FT. MSL)	SPILL-OVER ELEVATION (FT.) (MSL) +/- 0.3 FT	PROFILE LOCATION (FT.)
J1	84.0	85.7	84.8	1+92
C1	84.4	86.5	85.2	2+42

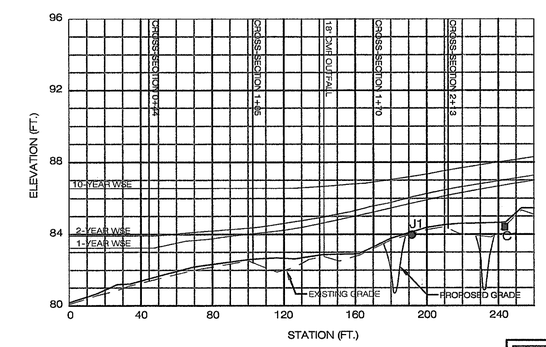
RESTORATION AREA 1: CONSTRUCTION ACTIVITIES

- REMOVE EXISTING CONCRETE DEBRIS
- STABILIZE DRAINAGE SWALE OUTFALL WITH ROCK-TOE PROTECTION
- IMPLEMENT ROCK-TOE PROTECTION
- INSTALL CROSS-VANE AND J-HOOK
- CHANNEL SHAPING AND STABILIZATION
- CREATE AND STABILIZE BANKFULL BENCH
- ADD SEEDING AND MATTING
- INSTALL BANK AND BUFFER PLANTINGS

WSE WATER SURFACE ELEVATION

WATER SURFACE ELEVATION (9/14/05)

NOTE: NO STREAM RESTORATION ACTIVITIES ARE PLANNED FOR CROSS-SECTION 0+44.

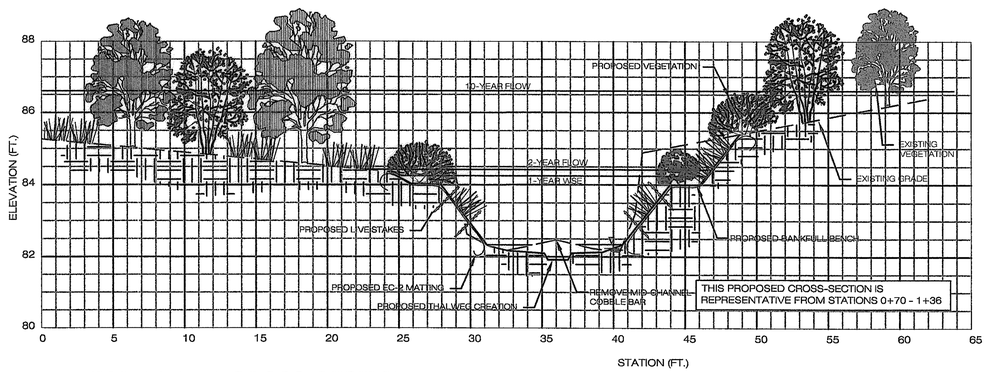


RESTORATION AREA 1 PROFILE

SCALE: HORIZONTAL 1 INCH = 40 FEET, VERTICAL 1 INCH = 4 FEET

J1 J-HOOK (1)

C1 CROSS-VANE (1)



REPRESENTATIVE CROSS-SECTION 1+05

SCALE: HORIZONTAL 1 INCH = 5 FEET, VERTICAL 1 INCH = 2 FEET

RESTORATION AREA 1: CONSTRUCTION DETAILS

STATION 0+70 - 3+16: SHEET 8
- RIGHT BANKFULL BENCH CREATION AND STABILIZATION

STATION 0+70 - 1+50, 1+92 - 2+56 : SHEET 8
- LEFT BANKFULL BENCH CREATION AND STABILIZATION

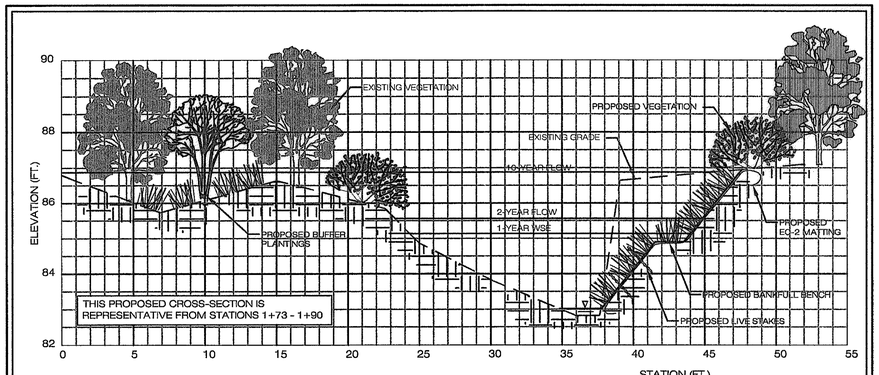
STATION 1+07 - 1+12: SHEET 8
- ROCK-TOE PROTECTION AT OUTFALL OF DRAINAGE SWALE

STATION 1+50- 1+73: SHEET 8
- RIGHT BANK ROCK-TOE PROTECTION

STATION 1+92: SHEET 8
- J-HOOK (1)

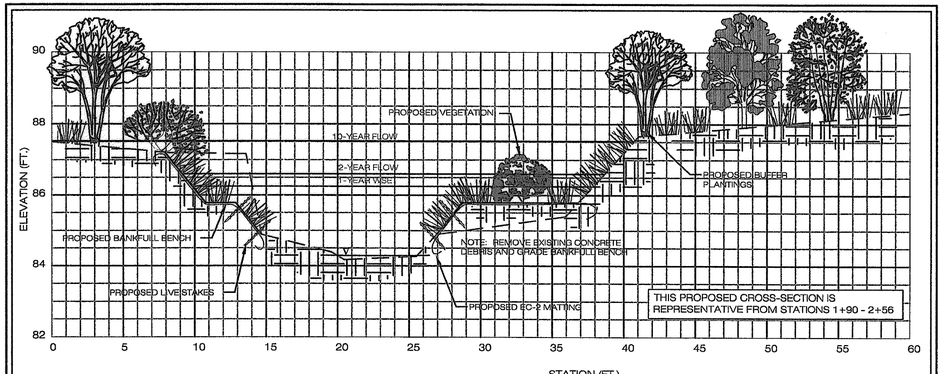
STATION 2+42: SHEET 8
- CROSS-VANE (1)

STATION 2+90: SHEET 8
- OUTLET PROTECTION (DESIGNED BY LAND DESIGN CONSULTANTS, DSP# 2004-0038)



REPRESENTATIVE CROSS-SECTION 1+70

SCALE: HORIZONTAL 1 INCH = 5 FEET, VERTICAL 1 INCH = 2 FEET



REPRESENTATIVE CROSS-SECTION 2+13

SCALE: HORIZONTAL 1 INCH = 5 FEET, VERTICAL 1 INCH = 2 FEET

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WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultans

PLAN AND PROFILE: {0+00 - 2+56}
RESTORATION AREA 1
TAFT AVENUE
CITY OF ALEXANDRIA, VIRGINIA

COMMONWEALTH OF VIRGINIA
JEFFREY T. HANCOCK
Lic. No. 37017
01/16/2008
PROFESSIONAL ENGINEER

REVISIONS:

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12/18/06	UPDATED LONGITUDINAL PROFILE
04/13/07	REVISED DESIGN
08/14/07	PER CITY/DEP REVIEW LETTER
01/15/08	PER CITY COMMENT

DRAWN BY: EBG/MAM
DESIGNED BY: TWC/EBG/NJL
DATE: 12/27/05
CHECKED BY: TWC/JTH

SHEET: 5
JOB#: 2256

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DEPARTMENT OF PLANNING & ZONING
DIRECTOR DATE
DEPARTMENT OF TRANSPORTATION &ENVIRONMENTAL SERVICES
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DIRECTOR DATE 2/1/08
CHAIRMAN, PLANNING COMMISSION DATE
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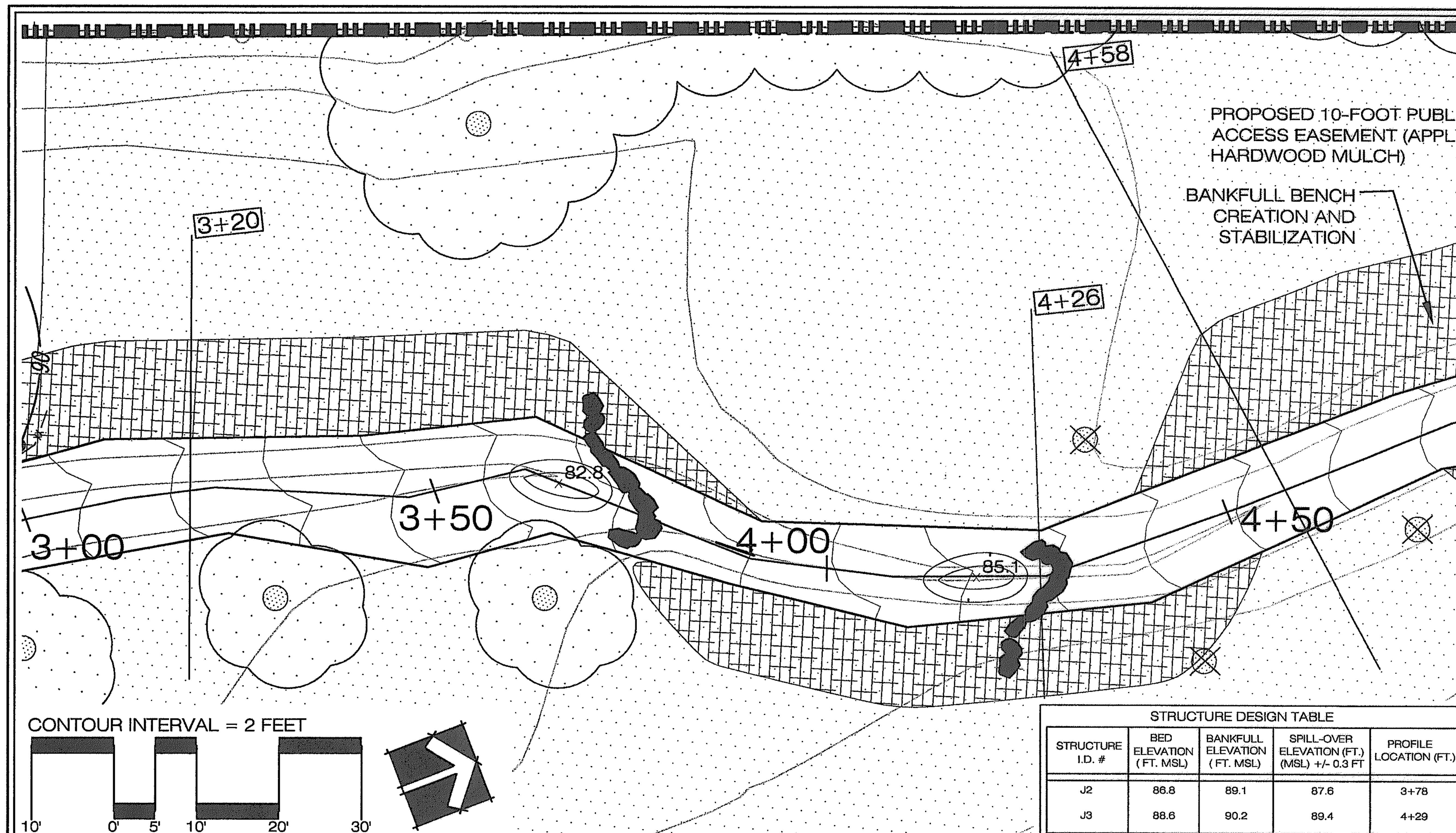


STRUCTURE DESIGN TABLE				
STRUCTURE I.D. #	BED ELEVATION (FT. MSL)	BANKFULL ELEVATION (FT. MSL)	SPILL-OVER ELEVATION (FT.) (MSL) +/- 0.3 FT	PROFILE LOCATION (FT.)
J2	86.8	89.1	87.6	3+78
J3	88.6	90.2	89.4	4+29

RESTORATION AREA 2:
CONSTRUCTION ACTIVITIES

- REMOVE EXISTING CONCRETE DEBRIS
- MANAGE NON-NATIVE VEGETATION
- INSTALL J-HOOKS
- CREATE AND STABILIZE BANKFULL BENCH
- ADD SEEDING AND MATTING
- INSTALL BANK AND BUFFER PLANTINGS

RESTORATION AREA 2:
CONSTRUCTION DETAILS

STATION 3+16 - 3+83: SHEET 8
- RIGHT BANKFULL BENCH CREATION AND STABILIZATION

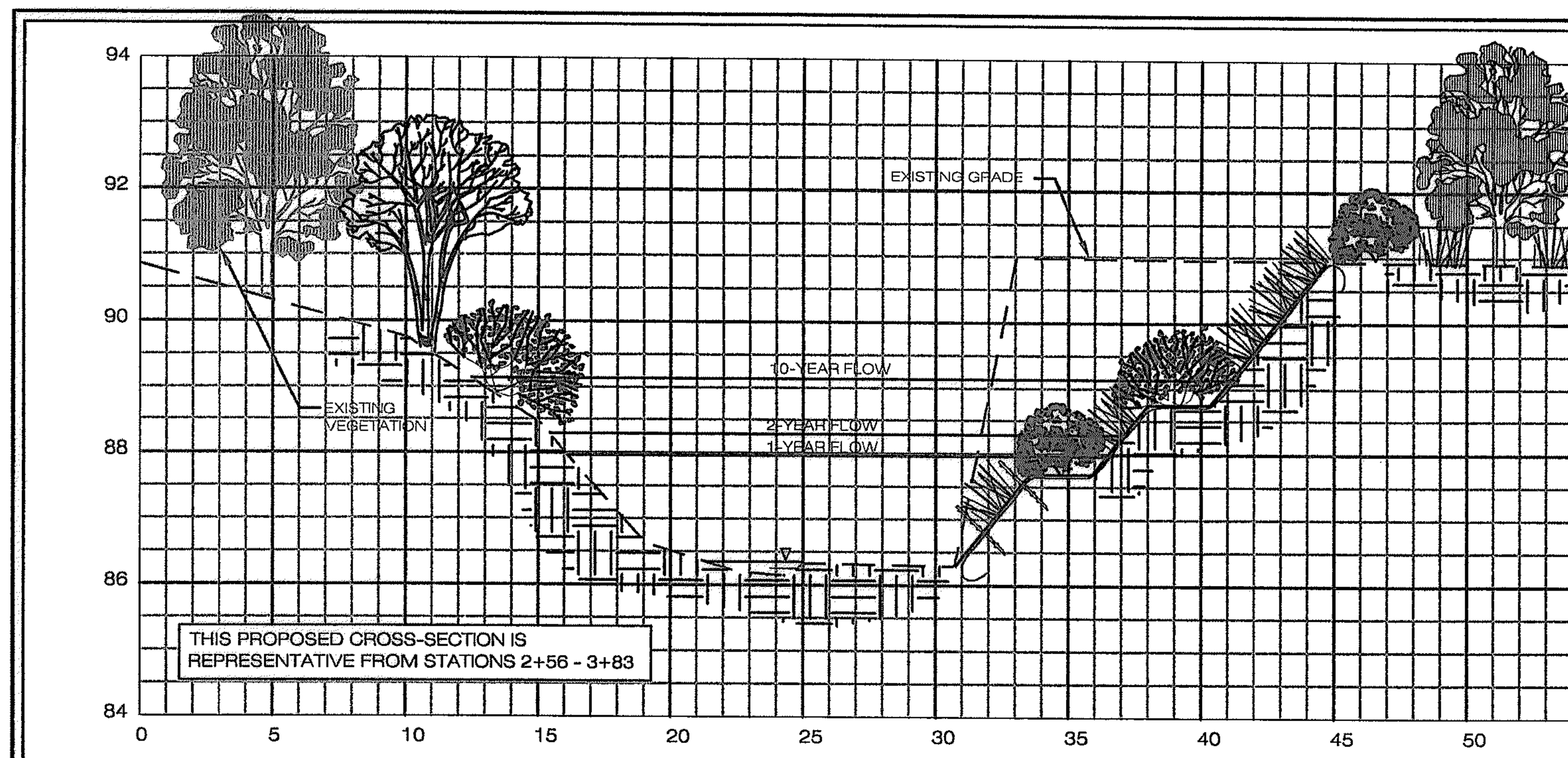
STATION 3+83 - 4+45: SHEET 8
- LEFT BANKFULL BENCH CREATION AND STABILIZATION

STATION 3+78 & 4+29: SHEET 8
- J-HOOKS (2-3)

STATION 4+45 - 4+80: SHEET 8
- RIGHT BANKFULL BENCH CREATION AND STABILIZATION

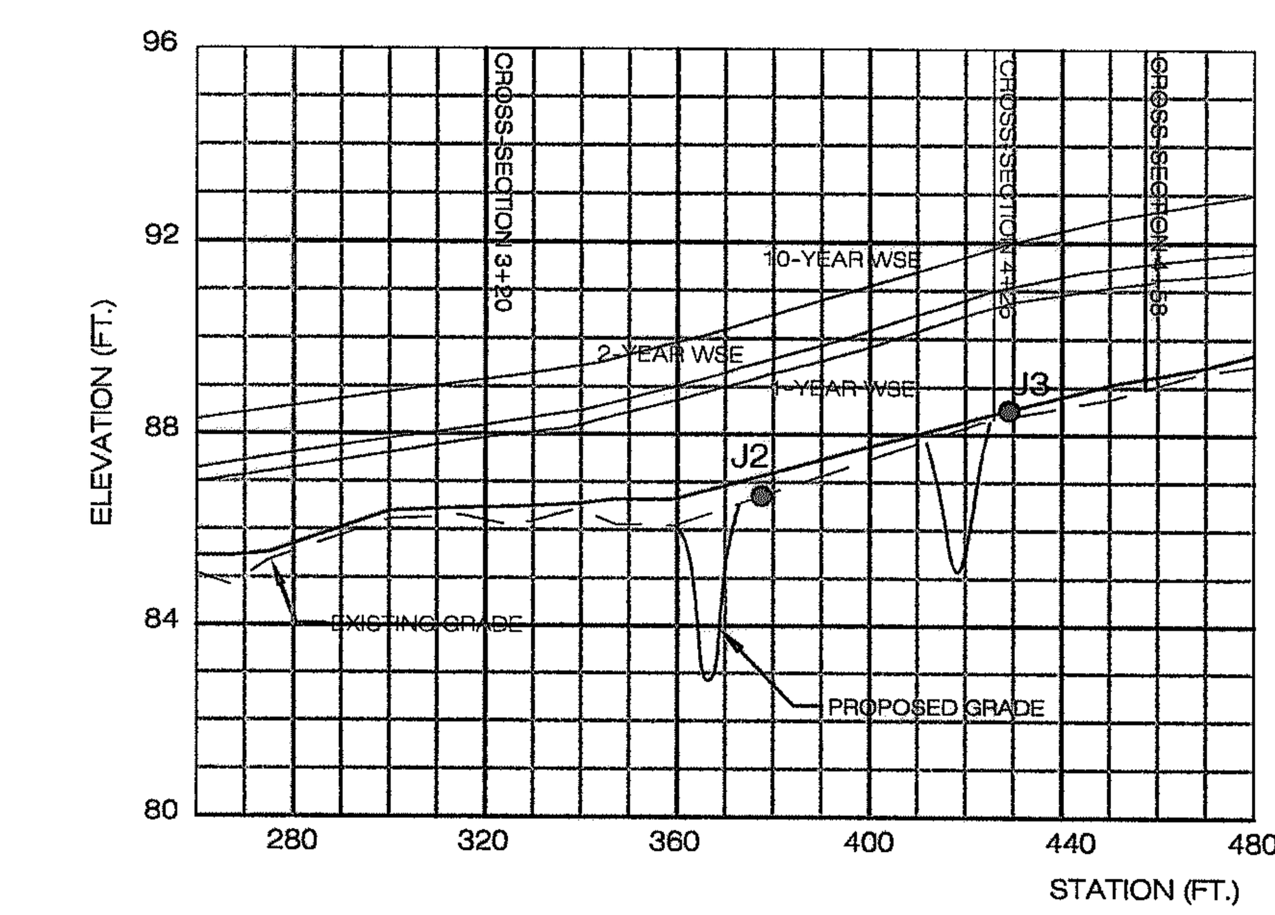
WSE WATER SURFACE ELEVATION

WATER SURFACE ELEVATION (9/14/05)



REPRESENTATIVE CROSS-SECTION 3+20

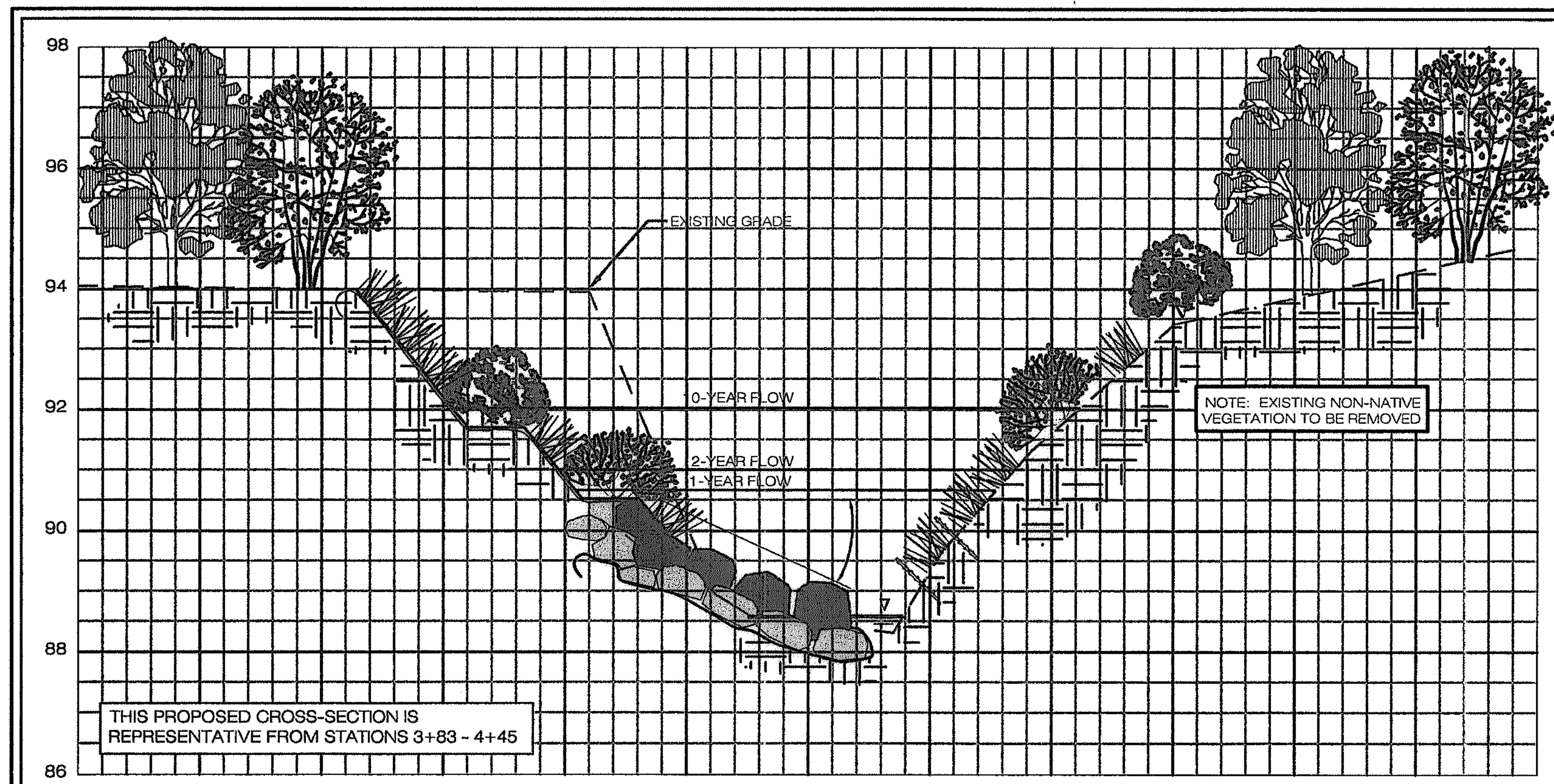
SCALE: HORIZONTAL 1 INCH = 5 FEET, VERTICAL 1 INCH = 2 FEET



RESTORATION AREA 2 PROFILE

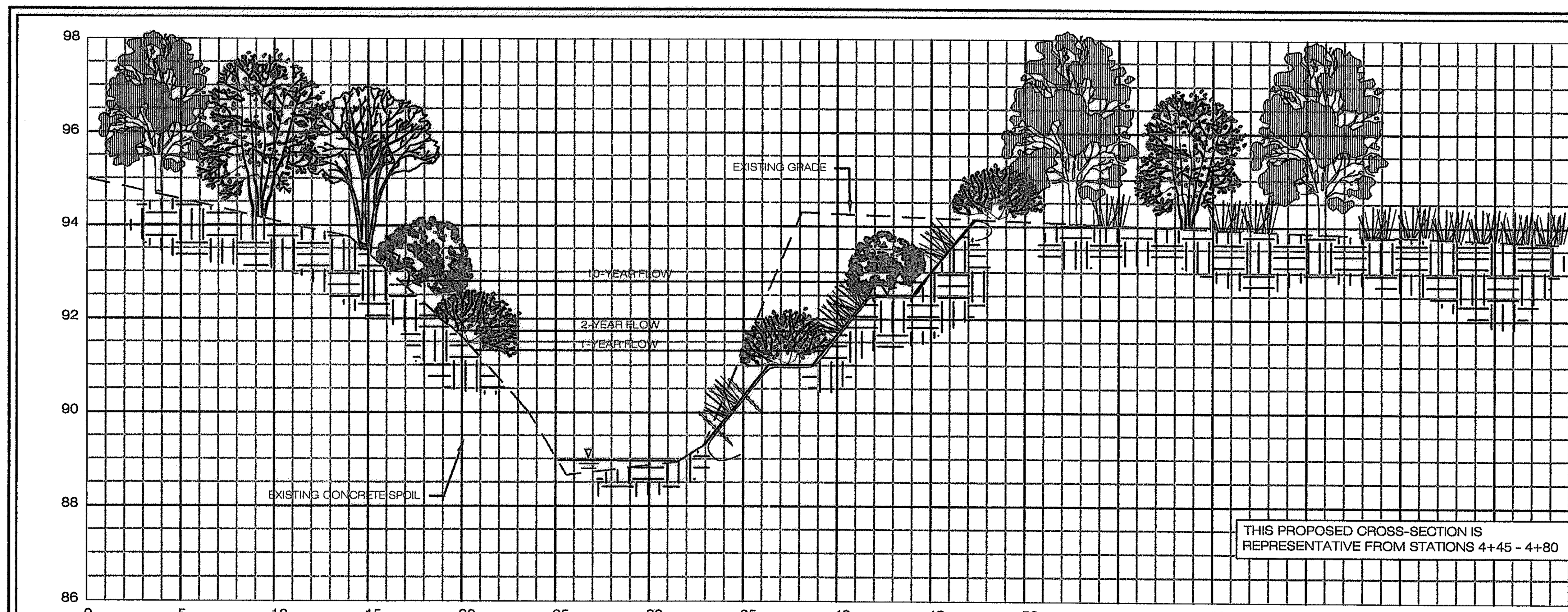
SCALE: HORIZONTAL 1 INCH = 4 FEET, VERTICAL 1 INCH = 40 FEET

J1 J-HOOK (2-3)



REPRESENTATIVE CROSS-SECTION 4+26

SCALE: HORIZONTAL 1 INCH = 5 FEET, VERTICAL 1 INCH = 2 FEET



REPRESENTATIVE CROSS-SECTION 4+58

SCALE: HORIZONTAL 1 INCH = 5 FEET, VERTICAL 1 INCH = 2 FEET

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PLAN AND PROFILE: {2+56 - 4+80}
RESTORATION AREA 2
TAFT AVENUE
CITY OF ALEXANDRIA, VIRGINIA

COMMONWEALTH OF VIRGINIA
JEFFREY T. HANCOCK
Lic. No. 37017
01/16/2008
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
12/18/06	UPDATED LONGITUDINAL PROFILE
04/12/07	BRIDGE RETAINED
08/14/07	PER 6/27/07 CITY REVIEW LETTER

DRAWN BY: EBG/MAM
DESIGNED BY: TWC/EBG/NJL
DATE: 12/27/05
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JOB#: 2256

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SPECIAL USE PERMIT NO. 2007-0017
DEPARTMENT OF PLANNING & ZONING
DIRECTOR DATE 2.4.08
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DIRECTOR DATE 2/1/08
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DATE RECORDED
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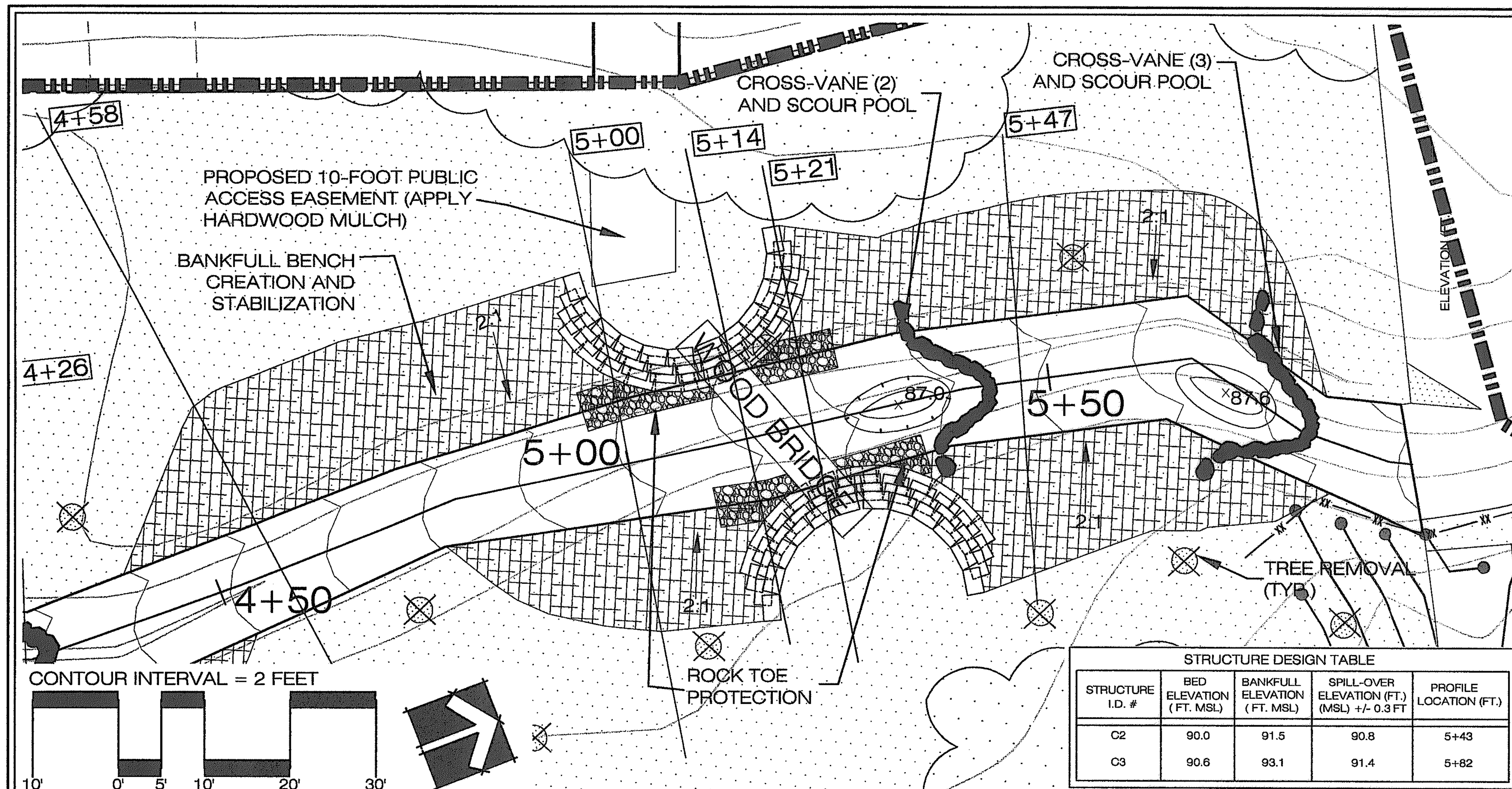
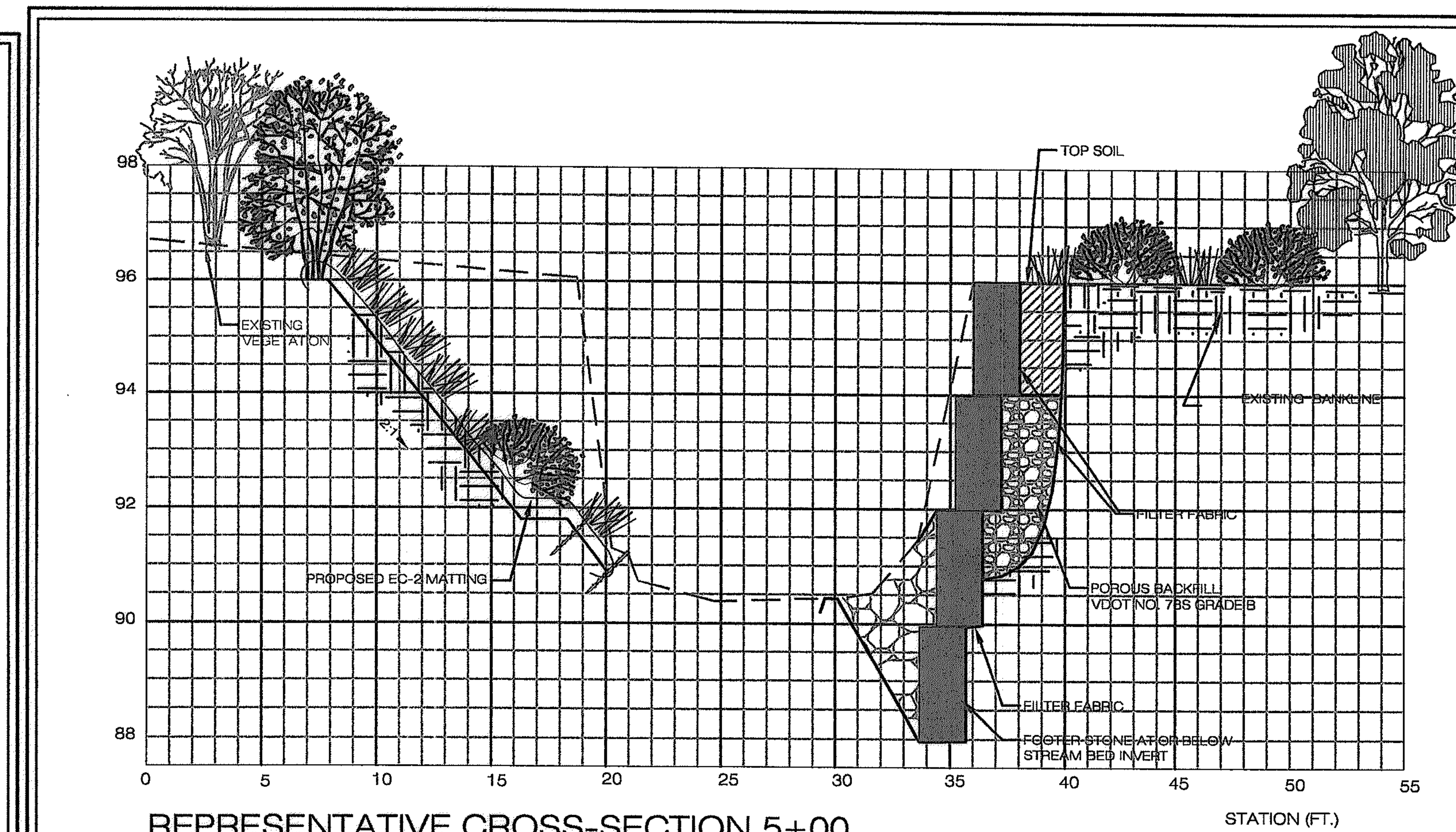


STRUCTURE DESIGN TABLE				
STRUCTURE I.D. #	BED ELEVATION (FT. MSL)	BANKFULL ELEVATION (FT. MSL)	SPILL-OVER ELEVATION (FT.) (MSL) +/- 0.3 FT	PROFILE LOCATION (FT.)
C2	90.0	91.5	90.8	5+43
C3	90.6	93.1	91.4	5+82



REPRESENTATIVE CROSS-SECTION 5+00

SCALE: HORIZONTAL 1 INCH = 5 FEET, VERTICAL 1 INCH = 2 FEET

RESTORATION AREA 3: CONSTRUCTION ACTIVITIES

- REMOVE EXISTING CONCRETE DEBRIS
- STABILIZE WOOD BRIDGE
- PROVIDE ROCK STABILIZATION AND ROCK-TOE PROTECTION
- INSTALL CROSS-VANES (2 AND 3)
- CREATE AND STABILIZE BANKFULL BENCH
- ADD SEEDING AND MATTING
- INSTALL BANK AND BUFFER PLANTINGS

RESTORATION AREA 3: CONSTRUCTION DETAILS

STATION 4+80 - 4+96: SHEET 8
- RIGHT BANKFULL BENCH CREATION AND STABILIZATION

STATION 4+80 - 5+10: SHEET 8
- LEFT BANKFULL BENCH CREATION AND STABILIZATION

STATION 4+96 - 5+23:
- RIGHT ROCK-TOE PROTECTION AND STACKED STONE WALL

STATION 5+10 - 5+44: SHEETS 8
- LEFT ROCK-TOE PROTECTION AND STACKED STONE WALL

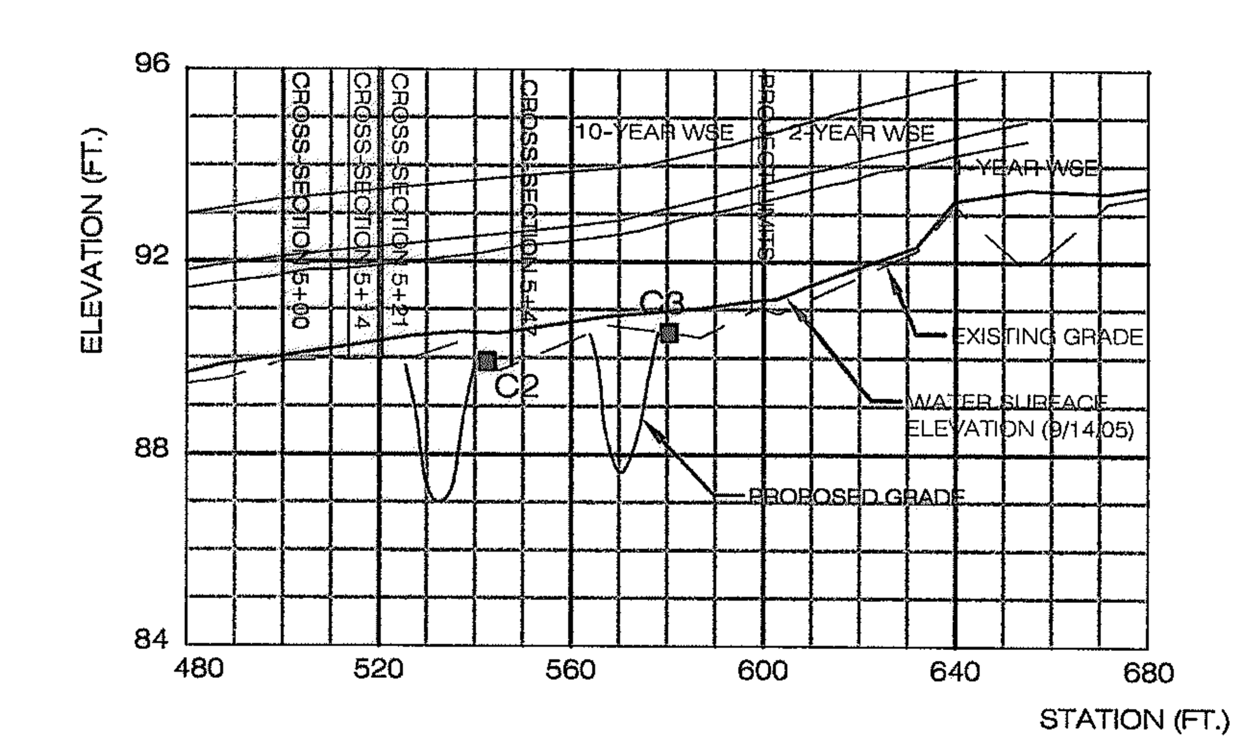
STATION 5+23 - 5+86: SHEET 8
- RIGHT AND LEFT BANKFULL BENCH CREATION AND STABILIZATION

STATION 5+43: SHEET 8
- CROSS-VANE (2)

STATION 5+82: SHEET 8
- CROSS-VANE (3)

WSE — WATER SURFACE ELEVATION (1-YEAR STORM)

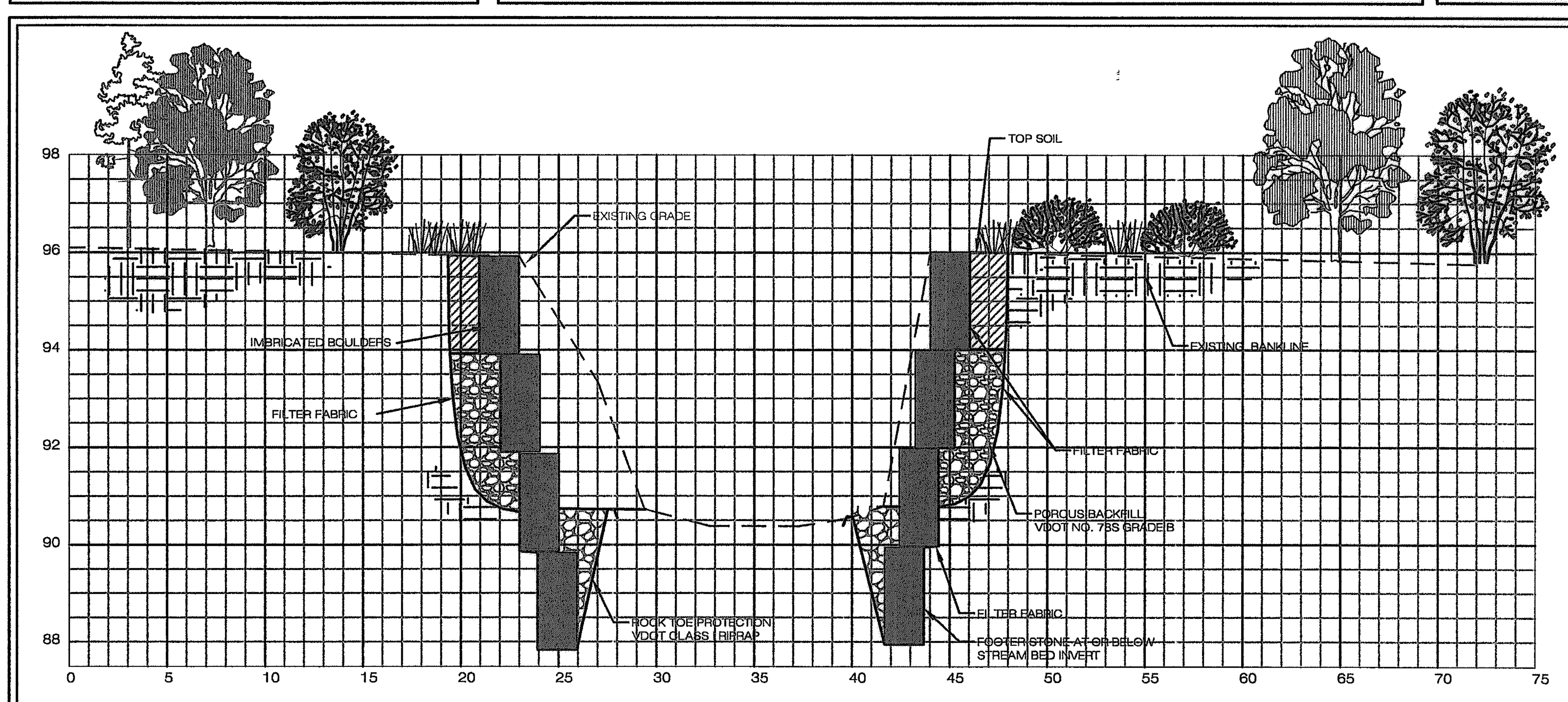
WATER SURFACE ELEVATION (9/14/05)



C2 CROSS-VANE (2)

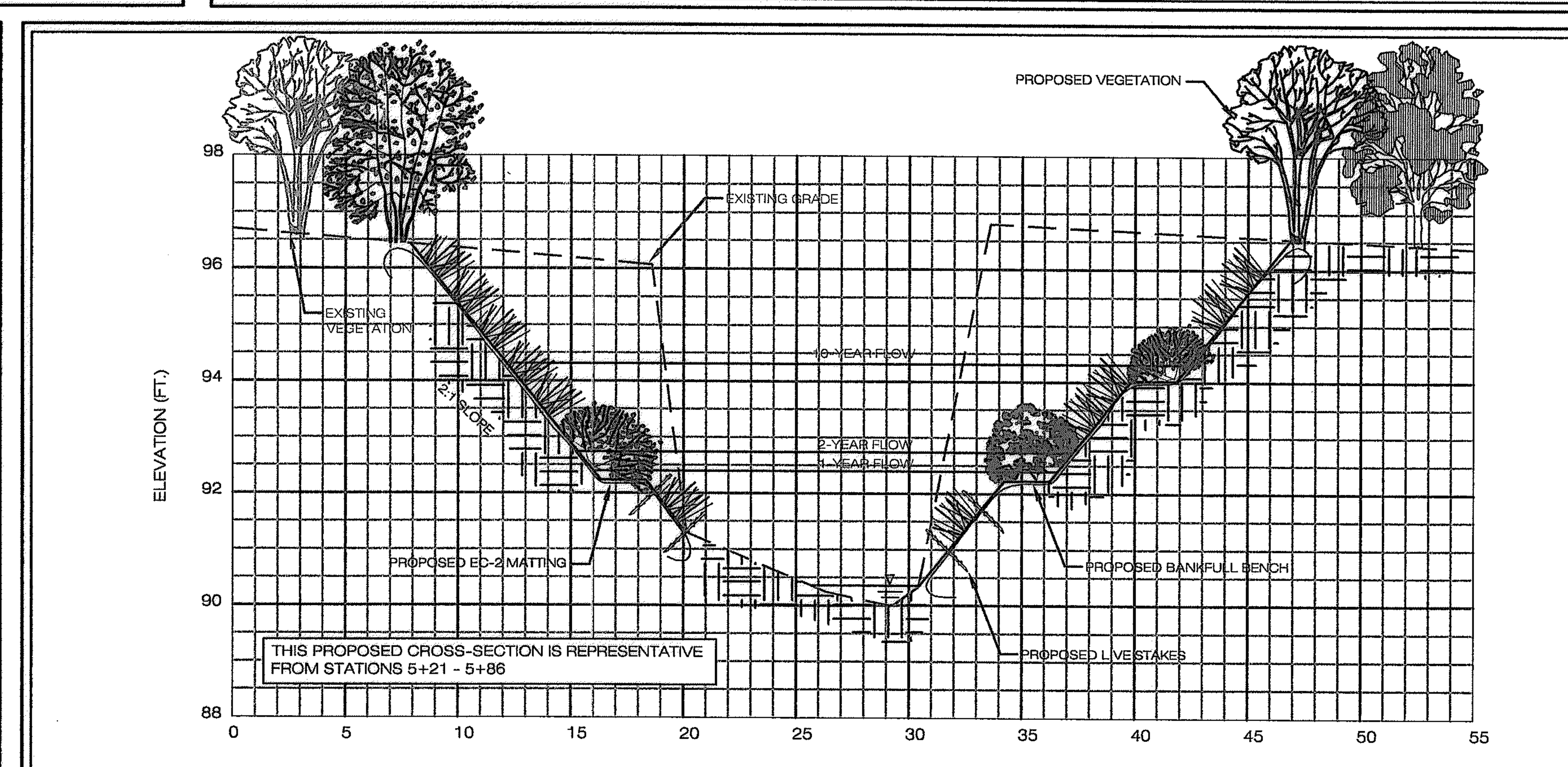
RESTORATION AREA 3 PROFILE

SCALE: HORIZONTAL 1 INCH = 4 FEET, VERTICAL 1 INCH = 40 FEET



REPRESENTATIVE CROSS-SECTION 5+14 - 5+21

SCALE: HORIZONTAL 1 INCH = 5 FEET, VERTICAL 1 INCH = 2 FEET



REPRESENTATIVE CROSS-SECTION 5+47

SCALE: HORIZONTAL 1 INCH = 5 FEET, VERTICAL 1 INCH = 2 FEET

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Environmental Consultants

PLAN AND PROFILE: {4+80 - 5+86} RESTORATION AREA 3
TAFT AVENUE
CITY OF ALEXANDRIA, VIRGINIA

COMMONWEALTH OF VIRGINIA
JEFFREY T. HANCOCK
Lic. No. 37017
01/16/2008
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
12/18/06	UPDATED LONGITUDINAL PROFILE
12/18/06	REMOVED BRIDGE; EXTENDED BANKFULL BENCH
04/12/07	BRIDGE RETAINED
08/14/07	PER 6/27/07 CITY REVIEW LETTER
10/11/07	PER 9/17/07 CITY REVIEW LETTER

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SHEET: 7
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DEPARTMENT OF PLANNING & ZONING
DIRECTOR 2·4·08 DATE
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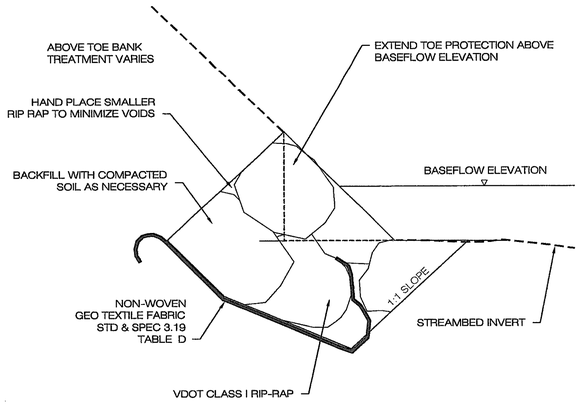
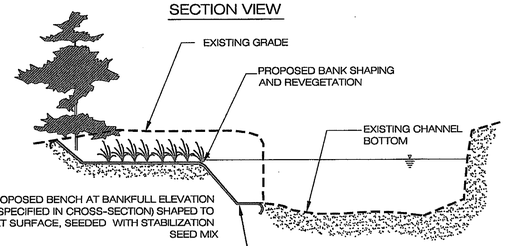
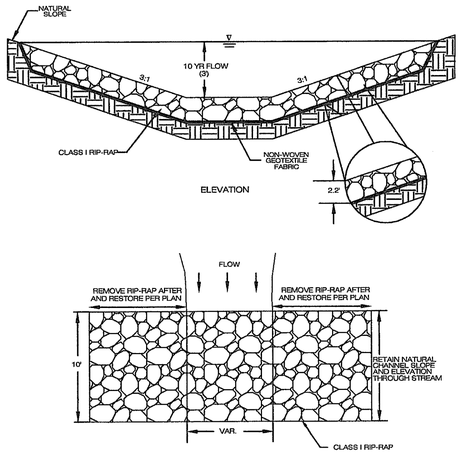


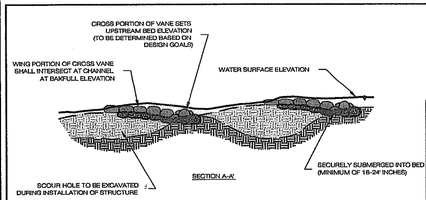
DETAIL : ROCK TOE PROTECTION
(ADAPTED FROM VIRGINIA E & S MANUAL. STD & SPEC 3.10) NTS

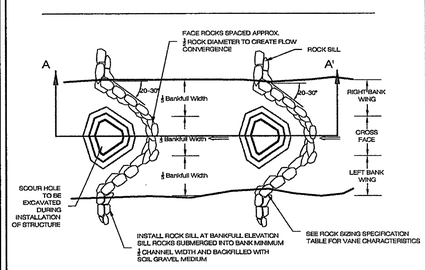


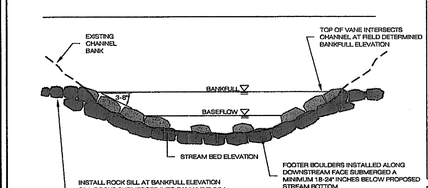
DETAIL : BANKFULL BENCH ENHANCEMENT NTS



TYPICAL: TEMPORARY LOW-WATER STREAM CROSSING NTS







DETAIL: TYPICAL CROSS VANE NTS

CONSTRUCTION SPECIFICATIONS

1. EXCAVATE TRENCH ALONG THE BOTTOM OF THE STREAM BED AND TO THE BANKFULL ELEVATION IN THE STREAMBANK FOR THE CENTER SECTION AND WINGS OF THE VANE. THE TRENCH SHOULD BE PERPENDICULAR TO THE STREAMBANKS IN THE MIDDLE ½ BANKFULL WIDTH FOR THE CENTER SECTION AND EXCAVATED TO THE DESIGN ANGLE IN THE ½ BANKFULL WIDTH FOR EACH ARM.

NOTE: VANE WINGS SHOULD BE PROPERLY TIED INTO THE BANK AT BANKFULL ELEVATION.

2. PLACE ONE OR TWO COURSE OF FOOTER BOULDERS TO THE MINIMUM SPECIFIED FOOTER DEPTH.

3. PLACE VANE ROCKS ON TOP OF FOOTER ROCKS SO THAT EACH HALF OF THE VANE ROCK RESTS ON ONE HALF OF A FOOTER ROCK BELOW. OFFSET THE VANE ROCK IN THE UPSTREAM DIRECTION AND PLACE SO THEY SLOPE SLIGHTLY AGAINST THE FLOW DIRECTION.

4. EXTEND THE STRUCTURE INTO THE BANK A MINIMUM OF 4 FEET AND ARMOR UPSTREAM AND DOWNSTREAM AS NEEDED FOR STABILITY WITH RIP RAP AND COMPACTED FILL MATERIALS.

5. AT THE BANKFULL ELEVATION, CREATE A SILL OF PLACED ROCK PERPENDICULAR TO THE STREAMBANK EXTENDING AWAY FROM THE VANE WING ARM. CONSTRUCT THE SILL PER VSRCM 4.5: CUT OFF SILLS AND LINEAR DEFLECTORS.

6. SEAL THE STRUCTURE ON THE UPSTREAM SIDE IF NEEDED.

7. EXCAVATE THE SCOUR POOL TO THE DESIGN DEPTH.

CONSTRUCTION RECOMMENDATIONS

1. ALWAYS USE AT LEAST TWO VANE ROCKS FOR THE MIDDLE ½ OF THE STRUCTURE.

2. PLACEMENT OF LARGE ROCK MAY REQUIRE A TRACK HOE WITH HYDRAULIC THUMB.

3. REQUIRE AN INSPECTION OF THE ROCK MATERIAL BEFORE IT IS PLACED.

4. IN TRUE SAND, SILT, AND CLAY BEDS, ROCK CROSS VANES MUST BE SEALED WITH FILTER FABRIC AND PLACED OPEN CLASS FILTER AGGREGATE.

5. ENSURE NO LEAKAGE/FLOW UNDER OR AROUND THE STRUCTURE BY PROPERLY GRADING, SEALING, AND COMPACTING UNDER AND AROUND THE STRUCTURE.

6. AFTER INSTALLATION, CHECK PROPER FUNCTION/FLOW PATH BY OBSERVING FLOW OVER THE STRUCTURE.

ROCK SIZING SPECIFICATIONS

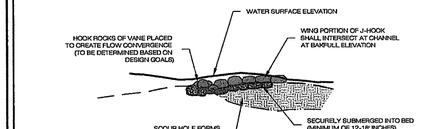
	SPECIFICATION	TOTAL LENGTH OF UNIT	COMMENT
WING ROCKS	SEE NOTE BELOW	12'	20 - 30°
CROSS FACE	SEE NOTE BELOW	5'	PERPENDICULAR TO FLOW
FOOTER BOULDERS	SEE NOTE BELOW	17'	ALIGNED WITH VANE ROCKS (SUBMERGED)
ROCK SILL	SEE NOTE BELOW	4'	PERPENDICULAR TO FLOW

NOTES:

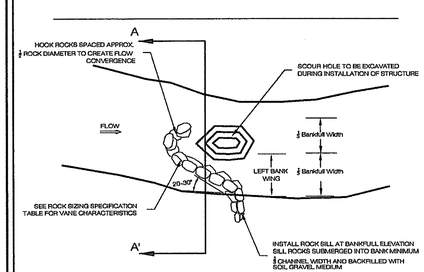
BOULDERS SHALL BE RELATIVELY FLAT, RECTANGULAR SHAPED, AND UNIFORM IN SIZE. AT A MINIMUM, THE BOULDERS SHALL BE 4 FEET LONG, 3 FEET WIDE, AND 2 FEET THICK. THE BOULDERS SHALL BE INSTALLED IN AN OVERLAPPING (IMBRICATED) MANNER WHEN POSSIBLE.

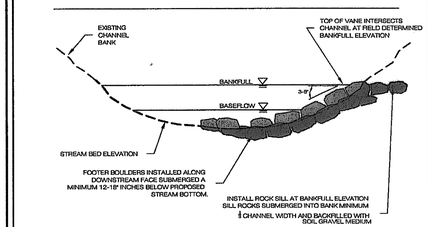
SEE 2004 VIRGINIA STREAM RESTORATION DESIGN MANUAL (VSRDM) FOR ADDITIONAL INSTALLATION GUIDELINES

BOULDER SIZES ARE MINIMUM UNLESS OTHERWISE SPECIFIED.



SECTION A-A'





DETAIL : TYPICAL J-HOOK VANE NTS

CONSTRUCTION SPECIFICATIONS

1. EXCAVATE TRENCH ALONG THE BOTTOM OF THE STREAM BED AND TO THE BANKFULL ELEVATION IN THE STREAMBANK FOR THE PLACEMENT OF THE WING OF THE VANE. THE TRENCH SHOULD BE ½ BANKFULL WIDTH AND TO THE DESIGN ANGLE FOR THE WING PORTION OF THE HOOK. PLACE THE HOOK ROCKS AT THE END OF THE VANE ARM IN ORDER TO ENCOURAGE LATERAL FLOW AND CREATE A SCOUR POOL NOTE: VANE WING SHOULD BE PROPERLY TIED INTO THE BANK AT BANKFULL ELEVATION.

2. PLACE ONE OR TWO COURSE OF FOOTER BOULDERS TO THE MINIMUM SPECIFIED FOOTER DEPTH.

3. PLACE VANE ROCKS ON TOP OF FOOTER ROCKS SO THAT THE VANE ROCK RESTS ON ONE HALF OF A FOOTER ROCK BELOW. OFFSET THE VANE ROCK IN THE UPSTREAM DIRECTION AND PLACE SO THEY SLOPE SLIGHTLY AGAINST THE FLOW DIRECTION.

4. EXTEND THE STRUCTURE INTO THE BANK A MINIMUM OF 4 FEET AND ARMOR UPSTREAM AND DOWNSTREAM AS NEEDED FOR STABILITY WITH RIP RAP AND COMPACTED FILL MATERIALS.

5. FILL VOIDS IN THE STRUCTURE WITH RIVER JACK STONES.

6. AT THE BANKFULL ELEVATION, CREATE A SILL OF PLACED ROCK PERPENDICULAR TO THE STREAMBANK EXTENDING AWAY FROM THE VANE WING ARM. CONSTRUCT THE SILL PER VSRCM 4.5: CUT OFF SILLS AND LINEAR DEFLECTORS.

7. SEAL THE STRUCTURE ON THE UPSTREAM SIDE IF NEEDED.

8. EXCAVATE THE SCOUR POOL TO THE DESIGN DEPTH.

CONSTRUCTION RECOMMENDATIONS

1. ALWAYS USE AT LEAST TWO ROCKS FOR THE HOOK OF THE STRUCTURE.

2. PLACEMENT OF LARGE ROCK MAY REQUIRE A SMALL TRACK HOE.

3. REQUIRE AN INSPECTION OF THE ROCK MATERIAL BEFORE IT IS PLACED.

4. IN TRUE SAND, SILT, AND CLAY BEDS, ROCK VANES MUST BE SEALED WITH FILTER FABRIC AND PLACED OPEN CLASS FILTER AGGREGATE.

5. ENSURE NO LEAKAGE/FLOW UNDER OR AROUND THE STRUCTURE BY PROPERLY GRADING, SEALING, AND COMPACTING UNDER AND AROUND THE STRUCTURE.

6. AFTER INSTALLATION, CHECK PROPER FUNCTION/FLOW PATH BY OBSERVING FLOW OVER THE STRUCTURE.

ROCK SIZING SPECIFICATIONS

	SPECIFICATION	TOTAL LENGTH OF UNIT	COMMENT
WING ROCKS	SEE NOTE BELOW	12'	20° FROM BANK
HOOK ROCKS	SEE NOTE BELOW	4-6'	HOOK ORIENTATION SPACED FROM VANE
FOOTER BOULDERS	SEE NOTE BELOW	16-18'	ALIGNED WITH VANE ROCKS (SUBMERGED)
ROCK SILL	SEE NOTE BELOW	4'	PERPENDICULAR TO FLOW

NOTES:

BOULDERS SHALL BE RELATIVELY FLAT, RECTANGULAR SHAPED, AND UNIFORM IN SIZE. AT A MINIMUM, THE BOULDERS SHALL BE 4 FEET LONG, 3 FEET WIDE, AND 2 FEET THICK. THE BOULDERS SHALL BE INSTALLED IN AN OVERLAPPING (IMBRICATED) MANNER WHEN POSSIBLE.

SEE 2004 VIRGINIA STREAM RESTORATION DESIGN MANUAL (VSRDM) FOR ADDITIONAL INSTALLATION GUIDELINES

BOULDER SIZES ARE MINIMUM UNLESS OTHERWISE SPECIFIED.

CONSTRUCTION NOTES

PROJECT SUMMARY
THE PROPOSED RESTORATION WITHIN STRAWBERRY RUN, A TRIBUTARY TO CAMERON RUN, COMBINES IN-STREAM STRUCTURES WITH BANK STABILIZATION TECHNIQUES. IN-STREAM STRUCTURES, INCLUDING J-HOOKS AND CROSS-VANES, WILL ALSO BE UTILIZED TO DIVERT EROSIVE FLOWS FROM OUTER BENDS AND PROVIDE GRADE CONTROL. ROCK TOE PROTECTION SHALL PROVIDE ADDITIONAL PROTECTION IN HIGH STRESS AREAS. BANKFULL BENCHES WILL BE INCORPORATED IN EXISTING ERODED AREAS TO STABILIZE THE BANKS AND PROVIDE FLOODWATER ATTENUATION.

AS PROPOSED MITIGATION FOR RPA IMPACTS, THE RESTORATION PLAN INCORPORATES APPROXIMATELY 0.8 ACRES OF RIPARIAN CORRIDOR REVEGETATION. IMPACTS TO EXISTING MATURE TREES SHALL BE AVOIDED AND MINIMIZED, WHILE NON-NATIVE VEGETATION (I.E. BAMBOO) SHALL BE MANAGED. NATIVE VEGETATION, INCLUDING TREES, SHRUBS, AND LIVE STAKES, SHALL BE USED TO RESTORE THE RIPARIAN BUFFER.

EXISTING VEGETATION:
THE EXISTING RIPARIAN CORRIDOR CONSISTS OF MAINTAINED GRASSES AND SCATTERED MATURE HARDWOODS WITH OCCASIONAL NON-NATIVE SPECIES (I.E. BAMBOO).

PROPOSED GRADING:
THE PROPOSED GRADING PLAN ENTAILS RESTORING A NATURAL, STABLE CHANNEL BY GRADING THE EXISTING BANKS ON A STABLE 2:1 SLOPE WHERE INDICATED.

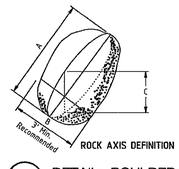
PROPOSED PLANTING PLAN:
ALL AREAS THAT HAVE BEEN DISTURBED DURING THE CONSTRUCTION MUST BE SEEDED WITH THE GENERAL STABILIZATION MIX AS SHOWN ON SHEET 11; PLANTING NOTES AND DETAILS. MATTING SPECIFICATIONS ARE LOCATED ON SHEET 10, AND PLANTING SPECIFICATIONS ARE LOCATED ON SHEET 11.

SITE PREPARATION
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATIONS OF ALL EXISTING UTILITIES WITHIN THE PROJECT AREA PRIOR TO COMMENCEMENT OF CONSTRUCTION OPERATIONS.
2. ALL DOWNSTREAM EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND CONSTRUCTED PRIOR TO THE COMMENCEMENT OF ANY UPSTREAM EARTHWORK ACTIVITIES ON-SITE. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED BY THE CONTRACTOR IN ACCORDANCE WITH THESE PLANS AND THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, THIRD EDITION, 1992 AND THE CONSTRUCTION NOTES AS SHOWN ON SHEET 10.
3. THE CONTRACTOR IS RESPONSIBLE FOR LAYOUT AND STAKE-OUT OF ALL WORK COVERED UNDER THESE PLANS.
4. ALL CONSTRUCTION AND DEMOLITION ACTIVITIES ASSOCIATED WITH THIS PROJECT SHALL BE ACCOMPLISHED IN SUCH A MANNER THAT CONSTRUCTION AND/OR WASTE MATERIALS DO NOT ENTER STATE WATERS.

MAINTENANCE OF THE PROJECT SITE:
1. THE CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS AND DISPOSE OF OFF-SITE IN ACCORDANCE WITH ALL LOCAL AND STATE LAWS AND REGULATIONS.
2. ALL EQUIPMENT AND SUPPLIES SHALL BE STORED WITHIN THE CONSTRUCTION STAGING AREA WHILE CONSTRUCTION ACTIVITIES HAVE CEASED FOR THE DAY.
3. THE CONTRACTOR SHALL PROVIDE ALL PROTECTION MEASURES AND DEVICES NECESSARY TO PROTECT THE PROPERTY, ADJACENT PROPERTY, EMPLOYEES, AND THE GENERAL PROJECT DURING THE DURATION OF THE PROJECT AND COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.
4. ALL EXISTING SITE IMPROVEMENTS TO REMAIN SHALL BE PROTECTED FROM DAMAGE. ANY DAMAGE CAUSED BY THE CONTRACTOR DURING CONSTRUCTION OPERATIONS UNDER THIS CONTRACT SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE.
5. THE CONTRACTOR IS AWARE THAT THE PROJECT SITE IS LOCATED WITHIN THE FLOODPLAIN OF A CREEK. THE SITE MAY FLOOD. THE CONTRACTOR WILL BE RESPONSIBLE FOR REMOVING OR PROTECTING EQUIPMENT DURING FLOOD EVENTS.

TOPSOIL STRIPPING
1. THE CONTRACTOR SHALL CAREFULLY STRIP THE EXISTING TOPSOIL FROM THE PROPOSED STREAM RESTORATION AREAS TO AN APPROXIMATE DEPTH OF THREE (3) TO SIX (6) INCHES (WHERE AVAILABLE) FOR RE-USE.
2. ALL TOPSOIL SHALL BE FREE FROM SUBSOIL, EXTRANEOUS MATTER, STONES OVER ONE (1) INCH IN ANY DIMENSION, STICKS, ROOTS, RUBBISH, AND STIFF CLAY.

CLEARING AND GRUBBING:
1. THE CONTRACTOR SHALL REMOVE ONLY THE TREES, STUMPS, SHRUBS, AND BRUSH AS SHOWN ON THE PLANS UNLESS SPECIFIED BY THE PROJECT ENGINEER.
2. ALL VEGETATION REMOVED WITHIN THE PROJECT LIMITS SHALL BE HAULED AND DISPOSED OF IN A LOCATION APPROVED BY THE ENGINEER.
3. ALL TRASH AND OTHER ON-SITE DEBRIS SHALL BE HAULED AND DISPOSED OF OFF-SITE BY THE CONTRACTOR.
4. ALL OFF-SITE DISPOSAL METHODS USED BY THE CONTRACTOR SHALL BE IN ACCORDANCE WITH ALL LOCAL AND STATE LAWS AND REGULATIONS. ANY NECESSARY PERMITS SHALL BE OBTAINED BY THE CONTRACTOR AT HIS EXPENSE. BURNING WILL NOT BE PERMITTED.



MINIMUM BOULDER SIZE

LENGTH (A AXIS) = 2 FEET MIN.

WIDTH (B AXIS) = 3 FEET MIN.

THICKNESS (C AXIS) = 2 FEET

DETAIL: BOULDER SIZING FOR VANES NTS

LIVE STAKES:
1. THE CONTRACTOR SHALL PROVIDE AND INSTALL WILLOW (SALIX SP.) AND DOGWOOD (CORNUS SP.) SPECIES AS THE LIVE STAKE SOURCE MATERIAL.
2. THE CUTTINGS FOR LIVE STAKES SHALL BE FRESHLY CUT AND ALIVE, SIDE BRANCHES REMOVED, AND BARK LEFT INTACT.
3. THE LIVE STAKES SHALL BE KEPT FRESH AND MOIST AFTER BEING CUT TO THE APPROPRIATE LENGTH.
4. THE LIVE STAKES SHALL BE TAMPED INTO GROUND AT RIGHT ANGLES TO SLOPE AND ANGLED DOWNSTREAM.
5. THE LIVE STAKES SHALL BE PLANTED AS SPECIFIED BY THE DETAIL LOCATED ON SHEET 11; PLANTING NOTES AND DETAILS.
6. LIVE STAKES THAT BECOME SPLIT, STRIP OR "MUSHROOM" DURING TAMPING SHALL BE REPLACED, AT NO ADDITIONAL COST TO THE OWNER.

ROCK FOR TOE PROTECTION:
1. CONTRACTOR SHALL INSTALL ROCK IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, 1992, THIRD EDITION, STD & SPEC 3.19, AND THE 2004 VIRGINIA STREAM RESTORATION AND STABILIZATION BMP GUIDE. SIZE AS SPECIFIED.
2. STONES SHALL BE ANGULAR AND PLACED TO CREATE A DENSE, WELL-GRADED MASS WITH A MINIMUM OF VOIDS.
3. ROCK TOE PROTECTION: BROWN/TAN CLASS I RIPRAP

BOULDERS FOR CROSS VANES AND J-HOOK VANES:
1. CONTRACTOR SHALL INSTALL ROCK IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, 1992, THIRD EDITION, STD & SPEC 3.19, AND THE 2004 VIRGINIA STREAM RESTORATION AND STABILIZATION BMP GUIDE. SIZE AS SPECIFIED.
2. FOOTER AND VANE BOULDERS SHALL BE RELATIVELY FLAT, RECTANGULAR SHAPED, AND UNIFORM IN SIZE. AT A MINIMUM, THE BOULDERS SHALL BE 2 FEET LONG, 3 FEET WIDE, AND 2 FEET THICK. THE BOULDERS SHALL BE INSTALLED IN AN OVERLAPPING (IMBRICATED) MANNER WHEN POSSIBLE. BOULDERS TO BE BROWN/TAN IN COLOR.
3. SIZE OF BOULDERS WERE DETERMINED IN ACCORDANCE WITH THE 2004 VIRGINIA STREAM RESTORATION AND STABILIZATION BMP GUIDE AND THE 2001 PAPER BY ROSGEN ENTITLED: "THE CROSS-VANE, W-WEIR, AND J-HOOK VANE STRUCTURES...THEIR DESCRIPTION, DESIGN, AND APPLICATION FOR STREAM STABILIZATION AND RIVER RESTORATION."

TREE AND SHRUB PLANTINGS:
ALL SHRUBS SHALL BE PLANTED IN THE RIPARIAN CORRIDOR AS SHOWN ON THE PLANTING PLAN SHOWN ON SHEET 11. PLACEMENT OF PLANT MATERIALS MAY BE CHANGED IN FIELD UPON APPROVAL OF ENGINEER.

SEEDBED PREPARATION
1. IMMEDIATELY FOLLOWING THE FINAL COMPLETION AND ACCEPTANCE OF FINE GRADING ACTIVITIES, SEEDBED PREPARATION SHALL COMMENCE.
2. FERTILIZER SHALL BE GRANULAR, NON-BURNING PRODUCT GUARANTEED ANALYSIS PROFESSIONAL FERTILIZER.
3. FERTILIZER SHALL BE DELIVERED TO THE SITE IN ORIGINAL UNOPENED CONTAINERS SHOWING WEIGHT, ANALYSIS, AND NAME OF MANUFACTURER. STORE IN A MANNER TO PREVENT WETTING AND/OR DETERIORATION.
4. FERTILIZER WITH A NITROGEN-PHOSPHOROUS-POTASH RATIO OF 10-20-10 SHALL BE APPLIED TO THE FINAL SEEDBED AT A RATE OF 12 LBS PER 1,000 ft².

SEEDING
1. STREAM RESTORATION SEEDING OPERATIONS SHALL IMMEDIATELY FOLLOW SEEDBED PREPARATION.
2. THE STABILIZATION SEED MIX SHALL BE APPLIED TO ALL DISTURBED AREAS PER THE RATES AND SEED MIX SPECIFICATIONS SHOWN ON SHEET 11.
3. CONTRACTOR SHALL NOT PERFORM SEEDING APPLICATION WHEN THE SOIL IS FROZEN.
4. SEEDED AREAS SHALL BE INSPECTED BY THE ENGINEER AT THE COMPLETION OF THE SEEDING OPERATIONS AND ACCEPTED SUBJECT TO COMPLIANCE WITH SPECIFIED MATERIALS AND INSTALLATION REQUIREMENTS.

EARTHWORK:
ALL FILL MATERIALS SHALL BE COMPACTED IN 8-12 INCH SOIL LIFTS AT 95% STANDARD PROCTOR OR AS APPROVED BY ENVIRONMENTAL CONSULTANT IN FIELD.

EROSION CONTROL BLANKETS:
CONTRACTOR SHALL INSTALL EC-2 MATTING (SPECIFICATION OR EQUIVALENT) IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, 1992, THIRD EDITION, STD & SPEC 3.36. SEE DETAILS ON SHEET 10 FOR SPECIFICATIONS.

EROSION AND SEDIMENT CONTROL:
ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED AS DETAILED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND AS SHOWN ON SHEETS 9 AND 10.

LIMITS OF DISTURBANCE:
THE APPROXIMATE LIMITS OF DISTURBANCE ARE 0.77 ACRE, AS DESIGNATED ON THE EROSION AND SEDIMENT CONTROL PLAN (SHEET 9). FINAL LIMITS OF DISTURBANCE SHALL BE COORDINATED BETWEEN THE CONTRACTOR AND THE SITE ENGINEER.

INGRESS AND EGRESS
THE INGRESS AND EGRESS EASEMENT IS LOCATED WITHIN THE PROPOSED 15 FOOT EASEMENT SURROUNDING THE PROPOSED STORMWATER PIPE, AS SHOWN ON SHEET 9.

NOTE: THE CONTRACTOR SHALL COORDINATE WITH THE SITE ENGINEER REGARDING SPECIFIC STAGING AND STOCKPILE PRACTICES AND LOCATIONS, CONSTRUCTION ACCESS, AND INGRESS/EGRESS EASEMENTS.

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STREAM RESTORATION NOTES AND DETAILS
TAFT AVENUE
CITY OF ALEXANDRIA, VIRGINIA

COMMONWEALTH OF VIRGINIA
COURTNEY T. HANCOCK
Lic. No. 37017
01/16/2008
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
5/23/06	REMOVED OUTLET PROTECTION DETAIL
12/18/06	INCLUDED ADDITIONAL NOTES
04/02/07	ROCK SPECIFICATIONS
09/14/07	PER 6/27/07 CITY REVIEW LETTER
10/11/07	PER 9/17/07 CITY REVIEW LETTER

DRAWN BY: EBG/MAM
DESIGNED BY: TWC/EBG/NJL
DATE: 12/27/05
CHECKED BY: TWC/JTH

SHEET: 8
JOB#: 2256

APPROVED
SPECIAL USE PERMIT NO. 2007-0018
DEPARTMENT OF PLANNING & ZONING
DIRECTOR — DATE 2.4.08
DEPARTMENT OF TRANSPORTATION & ENVIRONMENTAL SERVICES
SITE PLAN NO. 2007-0018
DIRECTOR — DATE 2/1/08
CHAIRMAN, PLANNING COMMISSION — DATE 2/4/08
DATE RECORDED
INSTRUMENT NO. DEED BOOK NO. PAGE NO.

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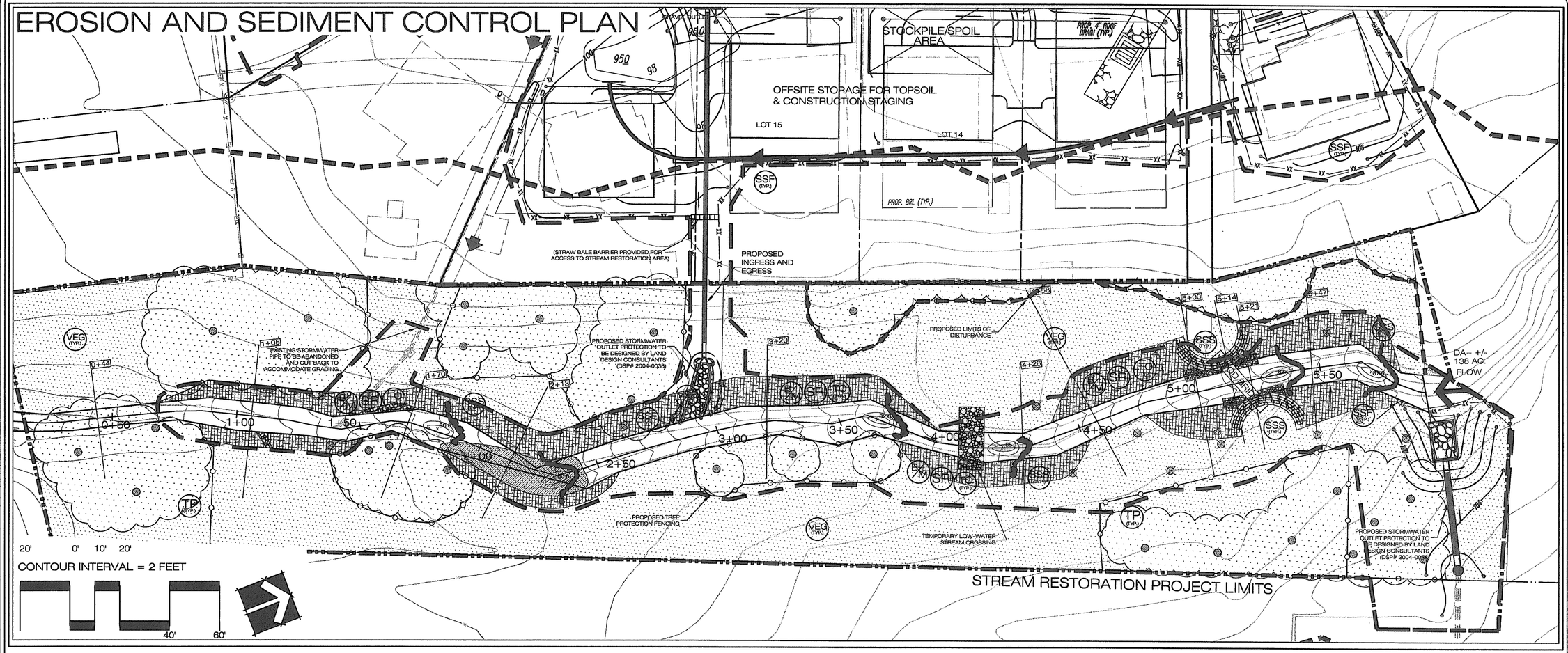
EROSION AND SEDIMENT CONTROL PLAN



LEGEND:

- PROJECT LIMITS
- APPROXIMATE STREAM CHANNEL LIMITS
- RESOURCE PROTECTION AREA LIMITS
- EXISTING CONTOURS
- EXISTING TREES (TO BE PROTECTED) (TP (TYP.))
- EXISTING TREES (TO BE REMOVED)
- PROPOSED ROCK STABILIZATION (SSS (TYP.))
- PROPOSED GRADING
- PROPOSED CROSS-VANE (SSS (TYP.))
- PROPOSED J-HOOK (SSS (TYP.))
- PROPOSED SCOUR POOL
- PROPOSED BUFFER RESTORATION AREA (VEG (TYP.))
- PROPOSED BANKFULL BENCH AND BANK GRADING (VSS (TYP.) B/M SR TO (TYP.))
- PROPOSED CHANNEL SHAPING
- SUPER SILT FENCE (SSF (TYP.))
- PROPOSED BRIDGE STABILIZATION
- UN-SURVEYED CROSS-SECTION (4+26)
- SURVEYED CROSS-SECTION (3+44)
- LIMITS OF DISTURBANCE

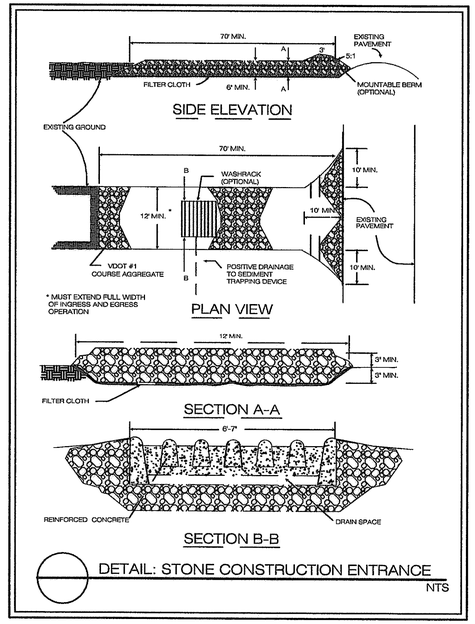
EROSION AND SEDIMENT CONTROL NARRATIVE

EROSION AND SEDIMENT CONTROL:
DUE TO THE NATURE AND SHORT CONSTRUCTION PERIOD OF THIS PROJECT, EROSION AND SEDIMENT CONTROL SHALL BE HANDLED IN THE FOLLOWING MANNER. ALL DETAILS AND EROSION AND SEDIMENT CONTROL MEASURES SHALL FOLLOW THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.

1. ALL CONSTRUCTION WILL TAKE PLACE FROM UPSTREAM TO DOWNSTREAM.
2. TREE PROTECTION SHALL BE INSTALLED TO SHOW LIMITS OF THE DISTURBANCE AND VEHICULAR TRAVEL PER THIS SHEET.
3. ALL VEHICULAR MOVEMENT SHALL BE CONFINED WITH THE PROJECT LIMITS AND THE OFFSITE STORAGE FOR TOPSOIL AND CONSTRUCTION STAGING. NO VEHICLES SHALL TRAVEL IN NOR MATERIALS PLACED WITHIN THE TREE PROTECTION AREAS.
4. TEMPORARY SANDBAG DIKES TO BE INSTALLED IN EXISTING STREAM AS WORK IS IN PROGRESS, TEMPORARY PUMP AROUND DIVERSIONS SHALL BE INSTALLED AS DIRECTED BY ENGINEER. THIS MEASURE WILL FURTHER HELP DETER THE MOVEMENT OF SEDIMENT DOWNSTREAM.
5. THE CONTRACTOR SHALL STABILIZE ALL DISTURBED AREAS WITH EC-2 MATTING PRIOR TO THE COMPLETION OF EACH WORK DAY. NO BARE SOIL SHALL BE LEFT EXPOSED AFTER THE CONTRACTOR HAS LEFT THE SITE.
6. AFTER THE FIRST UPSTREAM PORTION HAS BEEN COMPLETED, THE PERMANENT DOWNSTREAM SANDBAG DIKES SHALL BE PLACED. THIS MEASURE SHALL WORK TO SLOW ANY FLOW BEFORE ENTERING INTO THE EXISTING STREAM.
7. BEFORE EC-2 MATTING HAS BEEN PLACED, THE GENERAL STABILIZATION MIX SHALL BE INCORPORATED WITH THE NEWLY GRADED SUBSTRATE. SPECIFICATIONS FOR THIS MIX ARE LOCATED ON SHEET 11.
8. ONCE ALL GRADING AND STABILIZATION HAS BEEN COMPLETED, THE SANDBAG DIKES SHALL BE REMOVED.
9. REEXAMINE THAT ALL WORK HAS BEEN SEEDED AND STABILIZED PROPERLY.

NOTE: ALL ELEVATIONS SHALL BE CHECKED AT THE COMPLETION OF EACH WORK ZONE, OR AS NEEDED DURING THE CONSTRUCTION PERIOD.

CONSTRUCTION SEQUENCE:
STREAM RESTORATION SHALL BE COMPLETED IN CONJUNCTION WITH THE STORMWATER MANAGEMENT INFRASTRUCTURE IN AND AROUND TAFT AVENUE. NO CERTIFICATES OF OCCUPANCY FOR HOUSES ALONG TAFT AVENUE SHALL BE AWARDED UNTIL 90% OF THE STREAM RESTORATION IS COMPLETE AND THE RESTORATION IS CERTIFIED. THE REMAINING 10% OF THE STREAM RESTORATION SHALL BE COMPLETED WITHIN 6 MONTHS OF THE AWARD OF THE FIRST CERTIFICATE OF OCCUPANCY ALONG TAFT AVENUE.



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EROSION AND SEDIMENT CONTROL PLAN
TAFT AVENUE
CITY OF ALEXANDRIA, VIRGINIA

COMMONWEALTH OF VIRGINIA
JEFFREY T. HANCOCK
Lic. No. 37017
01/16/2008
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
5/9/06	EROSION AND SEDIMENT CONTROL PLAN ADDED
04/12/07	BRIDGE RETAINED
8/24/07	PER 6/27/07 CITY REVIEW LETTER
10/11/07	PER 9/17/07 CITY REVIEW LETTER
11/05/07	PER 11/05/07 CITY COMMENTS
01/15/08	PER CITY COMMENT

DRAWN BY: EBG/MAM
DESIGNED BY: TWC/EBG/NJL
DATE: 12/27/05
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SHEET: 9
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EROSION AND SEDIMENT CONTROL NOTES

NOTE: THE CONTRACTOR SHALL COORDINATE WITH THE SITE ENGINEER REGARDING SPECIFIC STAGING AND STOCKPILE PRACTICES AND LOCATIONS, CONSTRUCTION ACCESS, AND INGRESS/EGRESS EASEMENTS.

1. THE PURPOSE OF THE EROSION CONTROL MEASURES SHOWN ON THESE PLANS SHALL BE TO PRECLUDE THE TRANSPORT OF ALL WATERBORNE SEDIMENTS RESULTING FROM CONSTRUCTION ACTIVITIES AND ENTERING ONTO ADJACENT PROPERTIES OR STATE WATERS. IF FIELD INSPECTION REVEALS THE INADEQUACY OF THE PLAN TO CONFINE SEDIMENT TO THE PROJECT SITE, APPROPRIATE MODIFICATIONS SHALL BE MADE TO CORRECT ANY PLAN DEFICIENCIES. IN ADDITION TO THESE NOTES, ALL PROVISIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATION SHALL APPLY TO THIS PROJECT.

2. WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED PUBLIC ROADS, A TEMPORARY STONE CONSTRUCTION ENTRANCE WILL BE CONSTRUCTED TO MINIMIZE THE TRANSPORT OF SEDIMENT BY TRACKING ONTO THE PAVED SURFACE. WHERE SEDIMENT IS TRANSPORTED ONTO A PUBLIC ROAD SURFACE, THE ROAD SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A DISPOSAL AREA.

3. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, THIRD EDITION, 1992. THE CONTRACTOR SHALL BE THOROUGHLY FAMILIAR WITH ALL APPLICABLE MEASURES CONTAINED THEREIN WHICH MAY BE PERTINENT TO THIS PROJECT.

4. ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS PERTAINING TO WORKING IN, OR CROSSING, A LIVE WATERCOURSE SHALL BE MET.

5. PERIODIC INSPECTIONS OF ALL EROSION CONTROL MEASURES SHALL BE MADE BY THE CONTRACTOR TO ASSESS THEIR CONDITION. THIS INCLUDES INSPECTION AFTER EVERY ERODIBLE RAINFALL EVENT AND THE REPAIR OF MEASURES DAMAGED BY SUB-CONTRACTORS. ANY NECESSARY REPAIRS OR CLEAN UP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.

6. SEDIMENT CONTROL MEASURES MAY REQUIRE MINOR FIELD ADJUSTMENTS AT THE TIME OF CONSTRUCTION TO INSURE THEIR INTENDED PURPOSE IS ACCOMPLISHED. APPROVAL BY THE ENGINEER WILL BE REQUIRED FOR ANY DEVIATIONS FROM THE APPROVED PLANS.

7. THE CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION.

8. ALL EROSION CONTROL DEVICES SHALL BE IN PLACE AND FUNCTIONAL AT ALL TIMES AND IF REMOVED FOR CONSTRUCTION PROGRESS, SHALL BE REPLACED BY THE CLOSE OF EACH WORKDAY.

9. THE CONTRACTOR WILL LIMIT TEMPORARY, ON-SITE STOCKPILING OF SOILS BY DAILY REMOVAL OF EXCESS CUT MATERIAL FROM THE SITE. ANY TEMPORARY STOCKPILE LOCATED WITHIN THE PROJECT AREA WILL BE LOCATED BY THE CONTRACTOR AND SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES MINIMUM STANDARD 2 OF THE *VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS* . THE CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS BORROW AREAS AND SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE

10. PERMANENT OR TEMPORARY SOIL STABILIZATION MUST BE APPLIED TO ALL DENUDED AREAS WITHIN 1 DAY AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. SOIL STABILIZATION MUST ALSO BE APPLIED TO DENUDED AREAS WHICH MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN 2 DAYS. SOIL STABILIZATION MEASURES INCLUDE VEGETATIVE ESTABLISHMENT OR MULCHING.

11. IF DISTURBED AREA STABILIZATION IS TO BE ACCOMPLISHED DURING THE MONTHS OF DECEMBER, JANUARY, OR FEBRUARY, STABILIZATION SHALL CONSIST OF MULCHING IN ACCORDANCE WITH SPECIFICATION 3.35 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, THIRD EDITION. SEEDING WILL THEN TAKE PLACE AS SOON AS THE SEASON PERMITS.

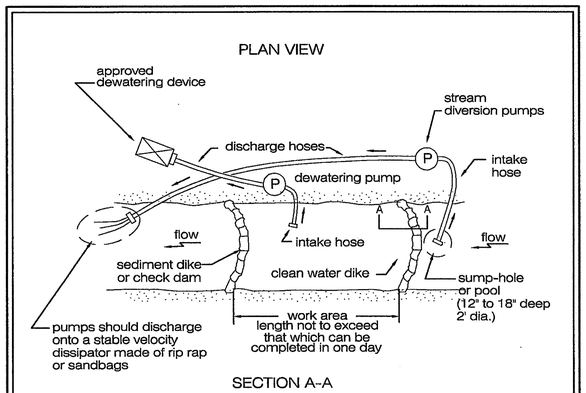
12. THE TERM SEEDING, FINAL VEGETATIVE COVER OR STABILIZATION, ON THIS PLAN SHALL MEAN THE SUCCESSFUL GERMINATION AND ESTABLISHMENT OF A STABLE COVER FROM A PROPERLY PREPARED SEEDBED CONTAINING THE SPECIFIED AMOUNTS OF SEED AND SOIL AMENDMENTS.

STRUCTURAL PRACTICES

ALL EROSION AND SEDIMENT CONTROL PRACTICES PROVIDED ON THE PLANS WILL BE CONSTRUCTED AND MAINTAINED ACCORDING TO THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (3RD EDITION, 1992) AND CITY OF ALEXANDRIA SPECIFICATIONS.

THE FOLLOWING STRUCTURAL PRACTICES ARE PROPOSED AND DETAILS ARE INCLUDED ON THE EROSION AND SEDIMENT CONTROL DETAILS SHEET IN THE SITE PLANS.

1. TREE PROTECTION: A FENCE BARRIER IS TO BE PLACED AROUND THE TREES AND VEGETATED AREAS WHICH WILL NOT BE DISTURBED TO PROTECT THE TREES AND OTHER VEGETATION FROM CONSTRUCTION EQUIPMENT AND SOIL COMPACTION WHERE DEEMED NECESSARY BY THE PROJECT ENGINEER.
2. STREAM DIVERSION: A TYPICAL DETAIL FOR THE PUMP AROUND STREAM DIVERSION IS INCLUDED ON SHEET 10 OF THE SUBMITTED PLAN. THE INTENT IS TO ACCOMPLISH IN-STREAM GRADING DURING BASEFLOW CONDITIONS, NOT DURING OR IMMEDIATELY FOLLOWING A STORMWATER RUNOFF EVENT, AND PROVIDE A PUMP AROUND DIVERSION OF THE BASEFLOW SUCH THAT GRADING IS DONE "IN THE DRY" TO THE GREATEST EXTENT PRACTICABLE. THE PUMP AROUND IN THE PLAN WILL CONSIST OF A LOW PERMEABILITY CHECK DAM LOCATED UPSTREAM TO IMPOUND FLOW ABOVE THE WORK AREA AND A PUMP DESIGNED TO DIVERT THE BASEFLOW DOWNSTREAM OF THE WORK AREA. ANOTHER CHECK DAM IS PROVIDED AT THE DOWNSTREAM END TO PREVENT DIVERTED WATER FROM BACKING UP INTO THE WORK AREA. A TYPICAL DETAIL FOR THE "DIRTBAG" FILTERING STRUCTURE AT THE OUTLET OF THE PUMP IS ALSO SHOWN ON SHEET 11; HOWEVER, AN EQUIVALENT FILTER MAY BE USED BASED ON VESCH GUIDELINES AND CITY OF ALEXANDRIA APPROVAL.
3. TOPSOILING: TOPSOIL SHALL BE USED TO PREPARE A SUITABLE SEED BED FOR PERMANENT VEGETATION. TOPSOIL WILL BE STRIPPED FROM AREAS TO BE GRADED AND TEMPORARILY STOCKPILED IN AN AREA COORDINATED BETWEEN THE CONTRACTOR AND THE SITE ENGINEER. STOCKPILE IN SUCH A MANNER THAT NATURAL DRAINAGE WILL NOT BE OBSTRUCTED AND NO OFF-SITE SEDIMENT DAMAGE WILL RESULT.
4. STRUCTURAL STREAMBANK STABILIZATION : BROWN/TAN RIPRAP WILL BE USED TO STABILIZE AREAS ON THE MAIN CHANNEL AND TRIBUTARIES, AS DESIGNATED ON THE PLAN AND PROFILE SHEETS. J-HOOKS AND CROSS VANES WILL BE CONSTRUCTED WITH BROWN/TAN IMBRICATED BOULDERS AND USED IN AREAS WHERE HIGH VELOCITIES ARE EXPECTED TO DIRECT STREAM FLOW WITHIN THE STREAM BANKS.
5. SURFACE ROUGHENING: AREAS TO BE PERMANENTLY VEGETATED SHALL BE SURFACE ROUGHENED, NOT SCRAPED SMOOTH, TO PROVIDE A SUITABLE SURFACE FOR APPLYING TOPSOIL.
6. PERMANENT SEEDING: PERMANENT VEGETATION WILL BE USED TO STABILIZE ALL DENUDED AREAS NOT OTHERWISE STABILIZED.
7. SOIL STABILIZATION BLANKETS: SOIL STABILIZATION BLANKETS WILL BE USED ON PORTIONS OF THE STREAMBANK AND SLOPES ABOVE THE STREAMBANK NOT OTHERWISE STABILIZED WITH RIPRAP. THE TREATMENT 1 (EC-2) BLANKETS ARE INTENDED TO PROVIDE TEMPORARY STABILIZATION AND PROMOTE CONDITIONS SUITABLE FOR THE GERMINATION AND GROWTH OF PERMANENT SEED.

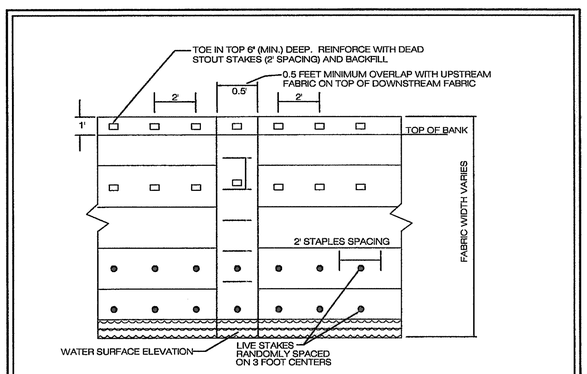


REVISED NOVEMBER 2000
PAGE 1.2 - 3

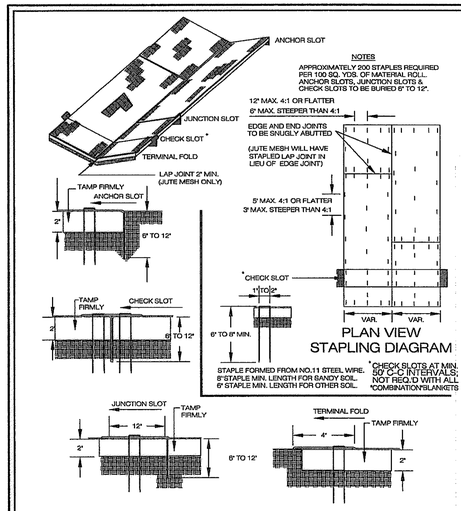
NOTES:

1. SET UP PUMP AND HOSE AS SHOWN, OR USE OTHER PRACTICAL ALTERNATIVES. PUMP SHOULD HAVE TWICE THE PUMPING CAPACITY OF ANTICIPATED FLOW.
2. ALL INTAKE HOSES WILL BE SCREENED.
3. DISMANTLE DOWNSTREAM DAM, THEN UPSTREAM DAM. KEEP PUMP RUNNING TO MAINTAIN STREAM FLOW.

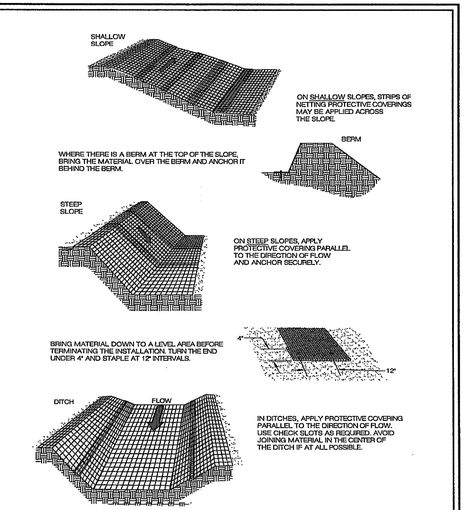
DETAIL: PUMP AROUND PRACTICE
NTS



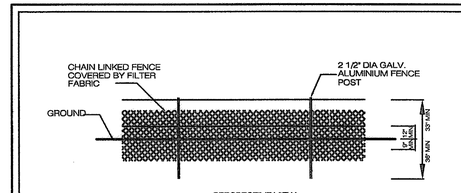
DETAIL: LIVE STAKE AND MATTING INSTALLATION
NTS



DETAIL: SC 150 BN N.A.G. E & S CONTROL
STAPLING DETAIL
NTS



DETAIL: SC 150 BN N.A.G. E & S CONTROL
BLANKET INSTALLATION
NTS

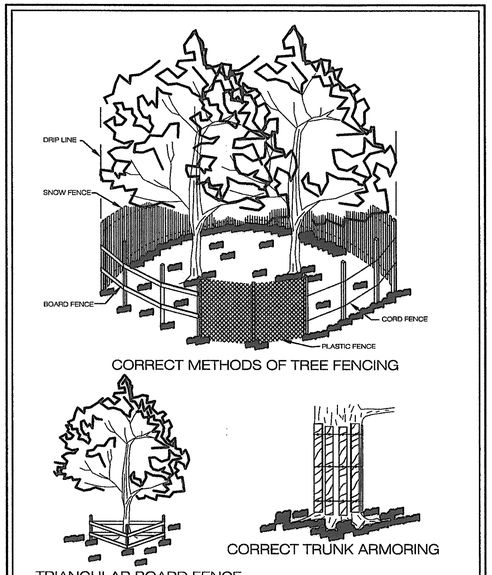


FENCING:

FENCING SHALL BE 42" HIGH CHAIN LINK FENCE CONSTRUCTED IN ACCORDANCE WITH THE LATEST VIRGINIA DEPARTMENT OF TRANSPORTATION CHAIN LINK FENCE DETAIL 502.04. THE SPECIFICATION FOR A 6'-0" FENCE SHALL BE USED, SUBSTITUTING 42" FABRIC AND 6'-0' LENGTH POSTS.

1. CHAIN LINK FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH TO BE FASTENED SECURELY TO CHAIN LINK FENCE WITH TIES EVERY 24" AT TOP AND MID SECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY 6' AND FOLDED.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SILT BUILDUPS REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

DETAIL: SUPER SILT FENCE
NTS



DETAIL: FENCING AND ARMORING
NTS

EROSION CONTROL MATTING

PRODUCT NAME	PRODUCT DESCRIPTION	ROLL SIZE	SPACING	REMARKS
SC150BN N.A.G.	ORGANIC NET	6.67 FT X 108 FT	AS REQUIRED	MATTING TO BE SECURED WITH BOTH STOUT AND LIVE STAKES

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EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

TAFT AVENUE
CITY OF ALEXANDRIA, VIRGINIA

COMMONWEALTH OF VIRGINIA
JEFFREY T. HANCOCK
Lic. No. 37017
01/16/2008
PROFESSIONAL ENGINEER

REVISIONS:
DATE:

5/8/08	TREE PROTECTION FENCING AND ARMORING DETAIL ADDED
09/14/07	PER 6/27/07 CITY REVIEW LETTER
10/31/07	PER 9/7/07 CITY REVIEW LETTER

DRAWN BY: EBG/MAM
DESIGNED BY: TWC/EBG/NJL
DATE: 12/27/05
CHECKED BY: TWC/JTH

SHEET: 10
JOB#: 2256

APPROVED
SPECIAL USE PERMIT NO. 2007-0018
DEPARTMENT OF PLANNING & ZONING
DIRECTOR — DATE 2.4.08
DEPARTMENT OF TRANSPORTATION & ENVIRONMENTAL SERVICES
SITE PLAN NO. 2007-0018
DIRECTOR — DATE 2/11/08
CHAIRMAN, PLANNING COMMISSION — DATE 2/14/08
DATE RECORDED
INSTRUMENT NO. — DEED BOOK NO. — PAGE NO.

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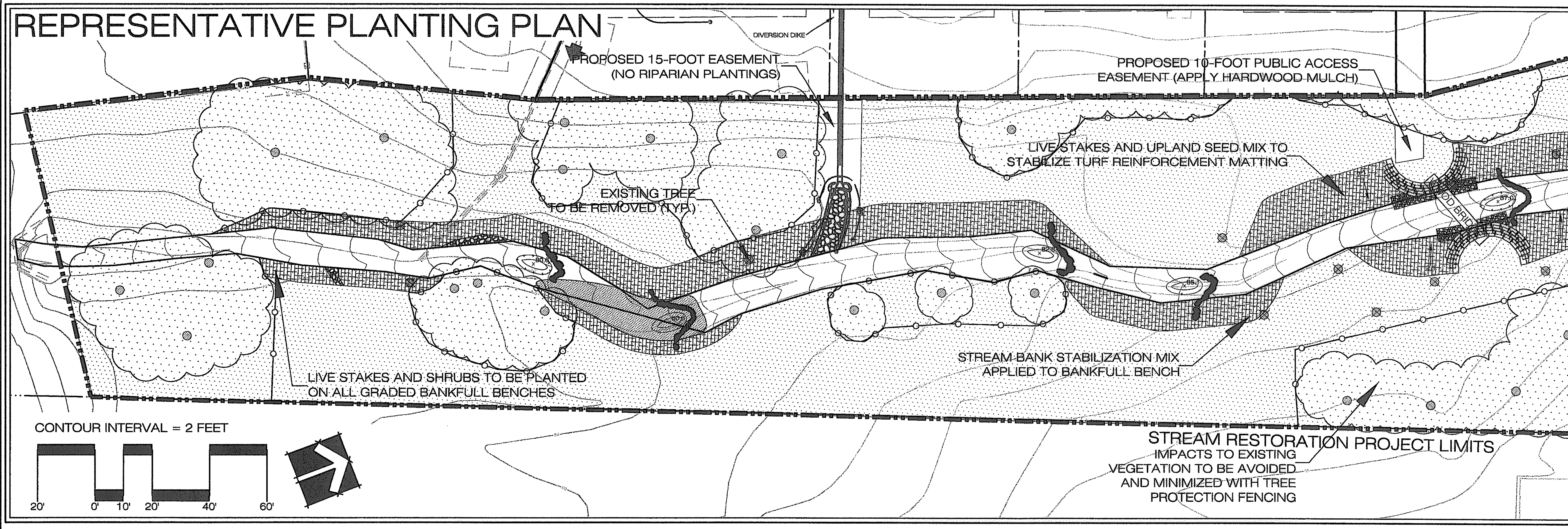
REPRESENTATIVE PLANTING PLAN



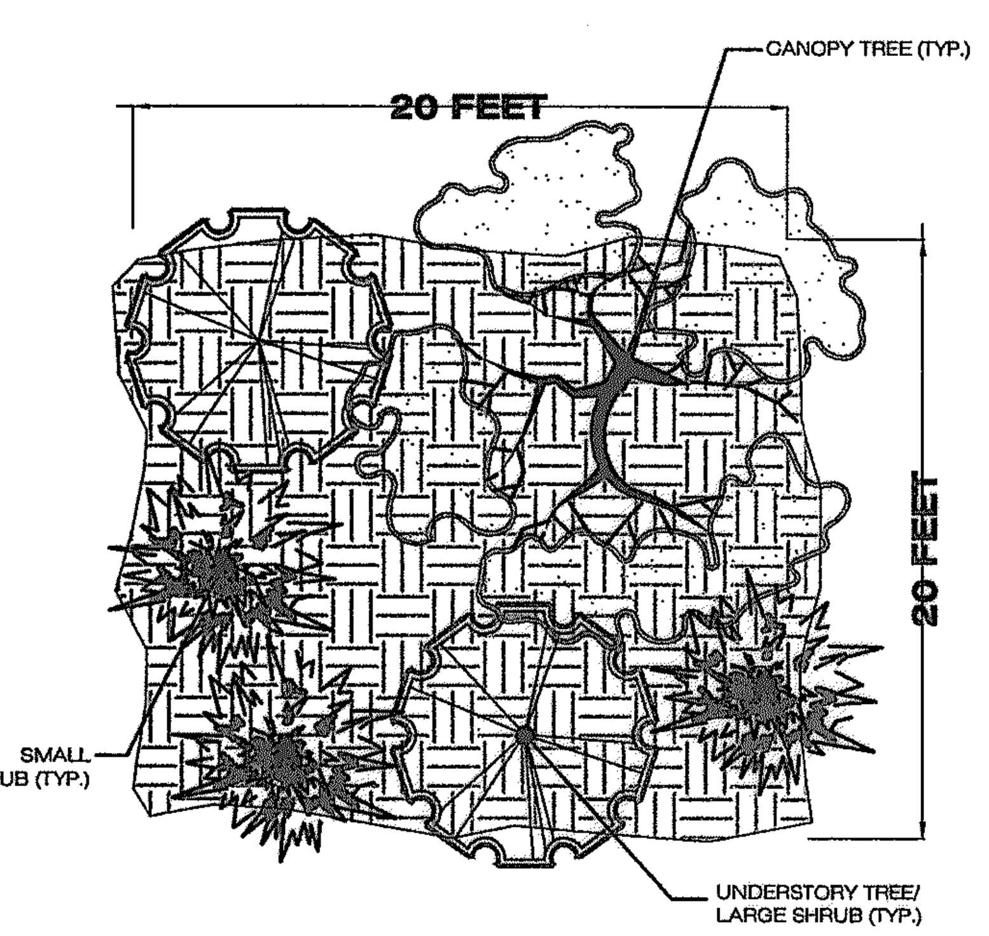
PROPOSED STREAM RESTORATION PLANTING PLAN

LEGEND	QUANTITY	BOTANICAL NAME	COMMON NAME	SPECIFICATION	INDICATOR	REMARKS
	1.0 ACRES +/-	UPLAND STABILIZATION SEED MIX				
	20%	Lespedeza virginica	SLENDER LESPEDEZA	SEED	UPL	SEED MIX SHALL BE SOWN ON ALL UPLAND DISTURBED AREAS AT A RATE OF 50LBS/AC.
	20%	Lolium multiflorum	ANNUAL RYE	SEED	NI	
	20%	Elymus virginicus	VIRGINIA WILD RYE	SEED	FACW-	
	10%	Andropogon scoparius	CAMPER LITTLE BLUESTEM	SEED	FACU	
	10%	Sorghastrum nutans	TOMAHAWK INDIAN GRASS	SEED	UPL	
	10%	Rudbeckia hirta	BLACK EYED SUSAN	SEED	FACU-	
	10%	Tridens flavus	PURPLE TOP	SEED	FACU	
	0.2 ACRES +/-	STREAM BANK STABILIZATION SEED MIX				
	30%	Lolium multiflorum	ANNUAL RYE	SEED	NI	SEED MIX SHALL BE SOWN BELOW GRADED BANKFULL BENCHES, EXCEPT CHANNEL BOTTOM, AT A RATE OF 50LBS/AC.
	10%	Carex vulpinoidea	FOX SEDGE	SEED	OBL	
	25%	Elymus virginicus	VIRGINIA WILD RYE	SEED	FACW-	
	20%	Panicum virgatum	SWITCH GRASS	SEED	FAC	
	10%	Leersia oryzoides	RICE CUTGRASS	SEED	FAC	
	5%	Lobelia cardinalis	CARDINAL FLOWER	SEED	FACW	
	0.8 ACRES +/-	CANOPY TREES				
	13	Acer rubrum	RED MAPLE	1 1/2-INCH CALIPER	FACW	CANOPY TREES TO BE PLANTED AT ONE (1) PER 400 SQUARE FEET IN BUFFER RESTORATION AREA. CANOPY TREES TO BE LOCATED OPPOSITE EXISTING TREES IN PLANTING AREA. USE 1 1/2-INCH CALIPER TREES AT MINIMUM.
	12	Carya tomentosa (cordiformis)	MOCKERNUT HICKORY (BITTERNUT)	1 1/2-INCH CALIPER	FACU-	
	13	Fraxinus pennsylvanica	GREEN ASH	1 1/2-INCH CALIPER	FACW	
	12	Liriodendron tulipifera	TULIP TREE	1 1/2-INCH CALIPER	FACU	
	12	Plantanus occidentalis	SYCAMORE	1 1/2-INCH CALIPER	FACW-	
	12	Quercus phellos	WILLOW OAK	1 1/2-INCH CALIPER	FAC+	
	12	Quercus palustris	PIN OAK	1 1/2-INCH CALIPER	FACW	
	0.8 ACRES +/-	UNDERSTORY TREES/LARGE SHRUBS				
	34	Amelanchier canadensis	SERVICEBERRY	1-INCH CALIPER	FAC	UNDERSTORY TREES AND LARGE SHRUBS TO BE PLANTED AT TWO (2) PER 400 SQUARE FEET IN BUFFER RESTORATION AREA. UNDERSTORY TREES AND LARGE SHRUBS TO BE SPACED AT 8' OC MINIMUM. USE 1-INCH CALIPER TREES AT MINIMUM.
	35	Cercis canadensis	RED BUD	1-INCH CALIPER	FACW	
	35	Hamamellis virginiaiana	WITCH HAZEL	1-INCH CALIPER	FAC-	
	35	Ilex opaca	AMERCIAN HOLLY	1-INCH CALIPER	FACU-	
	35	Viburnum prunifolium	BLACK HAW	1-INCH CALIPER	FACU	
	0.8 ACRES +/-	SMALL SHRUBS				
	53	Cornus amomum	SILKY DOGWOOD	15"-18" TUBELING	FACW+	SMALL SHRUBS TO BE PLANTED AT THREE (3) PER 400 SQUARE FEET IN STREAM RESTORATION AREA. SMALL SHRUBS TO BE SPACED AT 5' OC MINIMUM. USE 15 TO 18-INCH TUBELING SHRUBS AT MINIMUM.
	52	Lindera benzoin	SPICE BUSH	15"-18" TUBELING	FACW-	
	52	Kalmia latifola	MOUNTAIN LAUREL	15"-18" TUBELING	FACU	
	52	Morella cerifera	SOUTHERN WAXMYRTLE	15"-18" TUBELING	FAC	
	52	Viburnum dentatum	ARROWWOOD	15"-18" TUBELING	FAC	
	628 L.F. +/-	LIVE STAKES				
	210	Cornus amomum	SILKY DOGWOOD	3' MIN LENGTH	FACW+	PLANT QUANTITIES BASED ON A DOUBLE ROW OF LIVE STAKES, 3-FEET OFF CENTER .
	210	Salix nigra	BLACK WILLOW	3' MIN LENGTH	FACW	

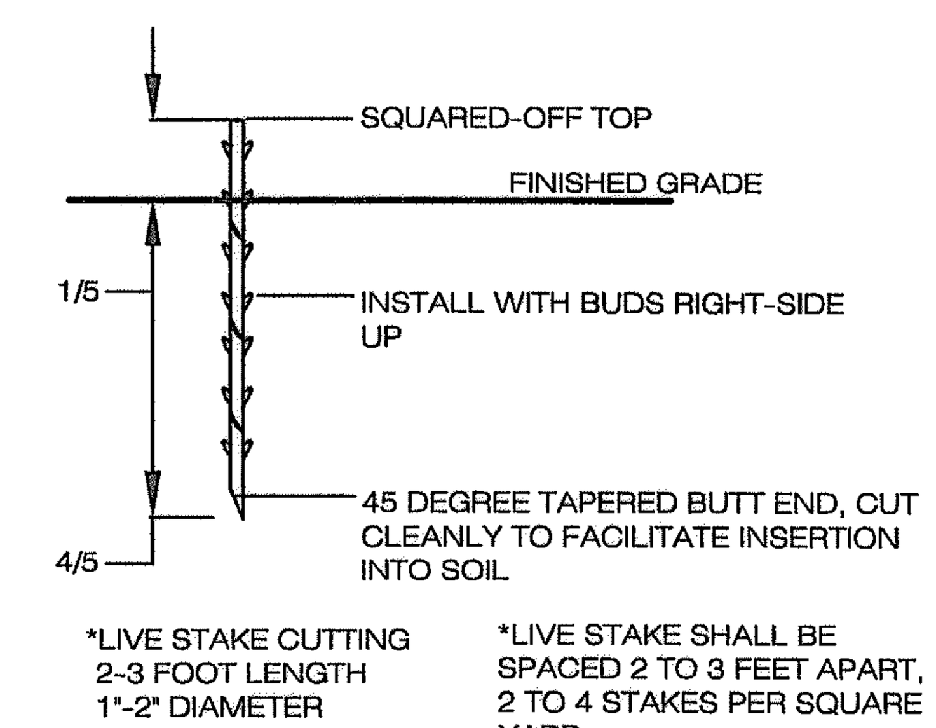
NOTE:
PLANTING QUANTITIES AND SIZING BASED ON VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION'S RIPARIAN BUFFER GUIDANCE MANUAL (2003).

PROPOSED NON-NATIVE SPECIES MANAGEMENT

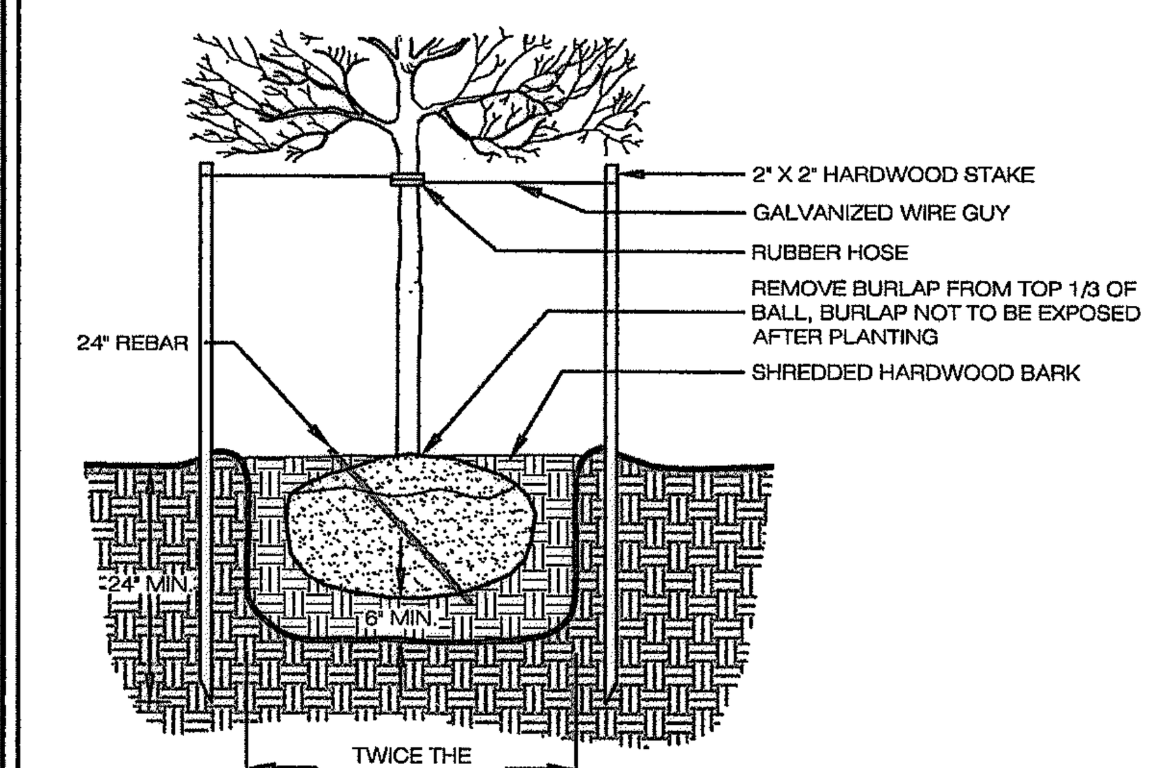
CONTRACTOR SHALL CUT NON-NATIVE SPECIES (E.G., BAMBOO) DURING STREAM RESTORATION ACTIVITIES. THE NON-NATIVE SPECIES WILL BE ALLOWED TO RE-SPROUT TO A MAXIMUM HEIGHT OF 2 FEET AND THEN SPRAYED WITH 4 TREATMENTS OF AN EPA-APPROVED AQUATIC HERBICIDE OVER 2 GROWING SEASONS.



TYPICAL VEGETATION RESTORATION
NTS



DETAIL : LIVE STAKE DETAIL
NTS



DETAIL : 1-1 1/2" CALIPER TREE INSTALLATION
NTS

PROPOSED PLANTING NOTES

SHRUB AND TREE INSTALLATION :

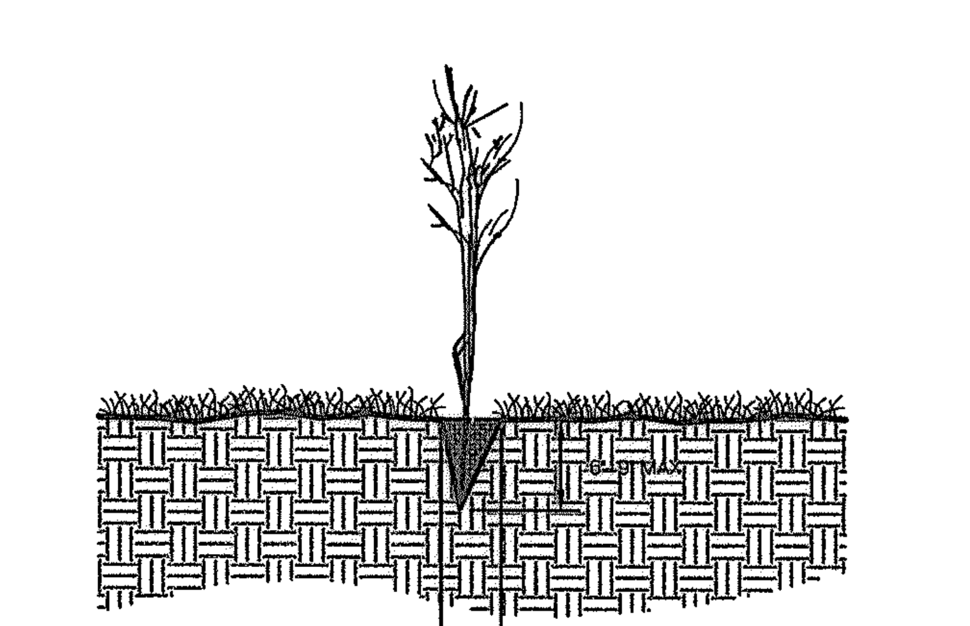
1. ALL PLANT MATERIAL, UNLESS OTHERWISE SPECIFIED, SHALL BE UNIFORMLY BRANCHED AND HAVE A VIGOROUS ROOT SYSTEM. PLANT MATERIAL SHALL BE HEALTHY, VIGOROUS, AND FREE FROM DEFECTS, DECAY, DISEASES, INSECT PEST EGGS, AND ALL FORMS OF INFESTATION. ALL PLANT MATERIAL SHALL BE FRESH, FREE FROM TRANSPLANT SHOCK OR VISIBLE WILT. PLANTS DEEMED UNHEALTHY WILL BE REJECTED.
2. ALL PLANT MATERIAL SHALL MEET THE MINIMUM SPECIFICATIONS AND STANDARDS DESCRIBED IN THE CURRENT ISSUE OF "THE AMERICAN STANDARD FOR NURSERY STOCK," PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, 1250 I STREET, N.W., SUITE 500, WASHINGTON, D.C. 2005.
3. ALL CONTAINERIZED STOCK SHALL HAVE BEEN PROPAGATED IN A CONTAINER LONG ENOUGH FOR THE ROOT SYSTEM TO HAVE DEVELOPED SUFFICIENTLY TO HOLD ITS SOIL. CONTAINERIZED STOCK WITH POORLY DEVELOPED ROOT SYSTEMS WILL NOT BE ACCEPTED.
4. PLANTS WILL BE PREPARED FOR SHIPMENT IN A MANNER THAT WILL NOT CAUSE DAMAGE TO THE BARK, BUDS, BRANCHES, STEMS, OR OVERALL SHAPE OF THE STOCK. CONTAINER-GROWN PLANTS SHALL BE TRANSPORTED IN THE CONTAINERS IN WHICH THEY HAVE BEEN GROWN.
5. PLANTS NOT INSTALLED ON THE DAY OF ARRIVAL ON SITE SHALL BE STORED AND PROTECTED BY THE CONTRACTOR. OUTSIDE STORAGE AREAS SHALL BE SHADED AND PROTECTED FROM THE WIND AND SUN. PLANTS STORED ON SITE SHALL BE PROTECTED FROM ANY DRYING AT ALL TIMES BY COVERING THE BALLS OR ROOTS WITH MOIST SAWDUST, WET BURLAP, WOODCHIPS, SHREDDED BARK, PEAT MOSS, OR OTHER SIMILAR MULCHING MATERIAL.
6. NO SUBSTITUTIONS IN SIZE OR VARIETY OF PLANT MATERIAL SHALL OCCUR WITHOUT THE PRIOR APPROVAL OF THE ENGINEER.
7. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD AND NOTIFY THE ENGINEER OF ANY VARIANCE FROM PLAN.
8. NO PLANTING SHALL OCCUR WHEN THE SOIL IS FROZEN.
9. THE FINAL LOCATION AND ORIENTATION OF ALL PLANT MATERIAL WILL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. THE CONTRACTOR MAY BE RESPONSIBLE FOR REPLANTING ANY PLANT MATERIAL INSTALLED WITHOUT APPROVAL BY THE ENGINEER.
10. HOLES FOR INDIVIDUAL PLANTINGS SHALL BE EXCAVATED TO PRODUCE VERTICAL SIDES AND FLAT BOTTOMS. ALL PLANTING HOLES SHALL HAVE ROUGHED, SCARIFIED SIDES AND BOTTOMS.
11. CONTAINERIZED PLANTS SHALL BE SET IN THE PLANTING PIT AT THE PROPER DEPTH ON TAMPED SOIL. SOIL REMOVED FROM THE PLANTING PIT AND AMENDED AS PER SPECIFICATIONS SHALL THEN BE FILLED AROUND THE ROOTS AND TAMPED.
12. THE CONTRACTOR SHALL INSTALL A SLOW RELEASE FERTILIZER TABLET IN EACH PLANTING HOLE AS PER MANUFACTURER'S DIRECTIONS ON LABEL.
13. DURING PLANTING, THE CONTRACTOR SHALL WATER EACH CONTAINERIZED PLANT INSTALLED WITH A MINIMUM OF 1 GALLON OF WATER, UNLESS OTHERWISE DIRECTED BY THE ENGINEER DUE TO EXISTING SITE CONDITIONS.

PLANTING SEQUENCE:

1. HOLES FOR INDIVIDUAL PLANTINGS SHALL BE EXCAVATED TO PRODUCE VERTICAL SIDES AND FLAT BOTTOMS. ALL PLANTING HOLES SHALL HAVE ROUGHED, SCARIFIED SIDES AND BOTTOMS.
2. APPLY ONE (1) TEN GRAM AGRIFORM FOREST STARTER TABLET OR EQUIVALENT PRODUCT TO EACH PLANT AS PER MANUFACTURER'S DIRECTIONS ON LABEL AT TIME OF PLANTING.
3. CONTAINERIZED PLANTS SHALL BE SET IN THE PLANTING PIT AT THE PROPER DEPTH ON TAMPED SOIL. SOIL REMOVED FROM THE PLANTING PIT AND AMENDED AS PER SPECIFICATIONS SHALL THEN BE FILLED AROUND THE ROOTS AND TAMPED.
4. THE CONTRACTOR SHALL RESTORE DISTURBED AREAS TO INDICATED FINAL GRADES IF DISTURBED BY THE INSTALLATION OF SHRUBS AND TREES.

PROJECT MAINTENANCE AND WARRANTY:

1. CONTRACTOR SHALL MAINTAIN INSTALLED SHRUBS AND TREES WITHIN THE PROJECT LIMITS UNTIL FINAL ACCEPTANCE OF THE PROJECT BY THE ENGINEER.
2. FINAL PAYMENT TO THE CONTRACTOR WILL BE AUTHORIZED AFTER A PERIOD OF ONE (1) YEAR IF A MINIMUM OF 80% SURVIVAL OF THE PLANTED MATERIAL HAS BEEN REACHED WITHIN THE PROJECT LIMITS AS SHOWN ON THIS SHEET.



NOTES:

1. BARE ROOT PLANTING HOLE SHALL BE OF SUFFICIENT SIZE AS NOT TO CRAMP THE ROOTS.
2. ONE AGRIFORM FERTILIZER TABLET SHALL BE PLACED AT THE BOTTOM OF EACH HOLE.
3. PLANTING HOLE SHALL BE TAMPED WITH FOOT TO SECURE BARE ROOT PLANT MATERIAL IN SOIL.
4. ROOTS TO BE PLACED IN A MINIMUM OF 6" OF SOIL.

DETAIL : TUBELING INSTALLATION
NTS

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Environmental Consultants

PLANTING NOTES AND DETAILS
TAFT AVENUE
CITY OF ALEXANDRIA, VIRGINIA

COMMONWEALTH OF VIRGINIA
JEFFREY T. HANCOCK
Lic. No. 37017
01/16/2008
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
05/22/06	REVISED BUFFER REVEGETATION TO REFLECT EASEMENTS
04/12/07	BRIDGE RETAINED
10/11/07	PER 9/17/07 CITY REVIEW LETTER
11/05/07	PER 11/02/07 CITY COMMENT
01/15/08	PER CITY COMMENT

DRAWN BY: EBG/MAM
DESIGNED BY: TWC/EBG/NJL
DATE: 12/27/05
CHECKED BY: TWC/JTH

SHEET: 11
JOB#: 2256

APPROVED
SPECIAL USE PERMIT NO. 2007-0008
DEPARTMENT OF PLANNING & ZONING
DIRECTOR 2.4.08 DATE
DEPARTMENT OF TRANSPORTATION & ENVIRONMENTAL SERVICES
SITE PLAN NO. 2007-0018
DIRECTOR 2/1/08 DATE
CHAIRMAN, PLANNING COMMISION DATE
DATE RECORDED
INSTRUMENT NO. DEED BOOK NO. PAGE NO.

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GENERAL NOTES

1. THE PROPERTY DELINEATED HEREON IS BY-RIGHT AND IS LOCATED ON ALEXANDRIA CADASTRAL MAP: 50.04 (7) PARCEL 27 AND 60.02 (2) PARCELS 1, 7, 14-18, AND 20-24.

2. THE TOPOGRAPHIC INFORMATION IS BASED UPON THE RESULT OF A FIELD SURVEY BY THIS FIRM. CONTOUR INTERVAL IS TWO FEET.

3. A RESOURCE PROTECTION AREA (RPA) IS LOCATED ON THE SUBJECT PROPERTY. THE SUBJECT PROPERTY IS LOCATED IN A RESOURCE MANAGEMENT AREA.

4. A PRELIMINARY GEOTECHNICAL REPORT HAS BEEN PREPARED FOR THIS APPLICATION. A FINAL REPORT WILL BE SUBMITTED WITH THE PRELIMINARY PLAN. NO MARINE CLAYS WERE DISCOVERED ON THE SUBJECT PROPERTY. ONLY TRACES OF CLAY. A COPY OF THIS REPORT WAS PROVIDED FOR THE PREVIOUS SUBMISSION. A FULL GEOTECHNICAL REPORT WITH CONSTRUCTION SPECIFICATION SHALL BE PROVIDED WITH THE PRELIMINARY PLAN.

5. ALL EXISTING BUILDINGS TO BE REMOVED UNLESS OTHERWISE NOTED.

6. NO HAZARDOUS OR TOXIC SUBSTANCES HAVE BEEN OBSERVED ON THE SUBJECT PROPERTY.

7. THE CITY SHALL PROVIDE SOLID WASTE DISPOSAL SERVICES TO THE SUBJECT PROPERTY. THE APPLICANT WILL PROVIDE ACCEPTABLE WASTE ENCLOSURES IN ACCORDANCE WITH ALL APPLICABLE CITY ORDINANCES.

8. THE PROPOSED STORM WATER MANAGEMENT FACILITIES SHALL BE MAINTAINED BY THE HOMEOWNERS. A SEPARATE MAINTENANCE AGREEMENT SHALL BE REQUIRED PRIOR TO ISSUANCE OF CONSTRUCTION PERMIT.

9. THE APPLICANT WILL CONTRIBUTE MONEY TO THE CITY'S AFFORDABLE HOUSING PROGRAM UPON APPROVAL OF THE PRELIMINARY PLAN.

10. THE PROPOSED DEVELOPMENT WILL NOT INCREASE THE NUMBER OF TRIPS GENERATED PER DAY; THEREFORE NO TRANSPORTATION IMPACT STUDIES OR TRANSPORTATION MANAGEMENT PLANS ARE REQUIRED.

11. A CERTIFICATE OF OCCUPANCY FOR EACH UNIT WILL BE OBTAINED PRIOR TO OCCUPANCY OF THE STRUCTURE IN ACCORDANCE WITH USBC 119.1.

12. A WALL LOCATION PLAT PREPARED BY A LAND SURVEYOR WILL BE SUBMITTED TO THE CODE ENFORCEMENT OFFICE PRIOR TO REQUESTING ANY FRAMING INSPECTIONS.

13. NO OFFSITE EASEMENTS OR PERMISSION IS ANTICIPATED TO BE REQUIRED FROM ADJACENT PROPERTY OWNERS IN ORDER TO COMPLETE THE PROPOSED CONSTRUCTION. IN CONJUNCTION WITH THE FINAL SITE PLAN, THE APPLICANT WILL DEMONSTRATE CONSTRUCTION TECHNIQUES UTILIZED TO KEEP CONSTRUCTION SOLELY ON THE SUBJECT PROPERTY.

14. CONSTRUCTION PERMITS WILL BE OBTAINED FOR THIS PROJECT. ALL CONSTRUCTION WILL COMPLY WITH THE CURRENT EDITION OF THE UNIFORM STATEWIDE BUILDING CODE (USBC) & INTERNATIONAL RESIDENTIAL CODE (IRC).

15. A RODENT ABATEMENT PLAN WILL BE SUBMITTED TO CODE ENFORCEMENT PRIOR TO THE ISSUANCE OF A DEMOLITION PERMIT OR LAND DISTURBANCE PERMIT.

16. ALL EXTERIOR WALLS WITHIN 5 FEET FROM AN INTERIOR PROPERTY LINE SHALL HAVE A FIRE RESISTANCE RATING OF 1 HOUR, FROM BOTH SIDES, WITH NO OPENINGS PERMITTED WITHIN THE WALL. AS AN ALTERNATIVE, A 2 HOUR FIRE WALL MAY BE PROVIDED.

17. ROOF DRAINAGE SYSTEMS WILL BE INSTALLED SO AS NOT TO IMPACT UPON OR CAUSE EROSION/DAMAGE TO ADJACENT PROPERTIES.

18. CALL ALEXANDRIA ARCHAEOLOGY (703-838-4399) IMMEDIATELY IF ANY BURIED STRUCTURAL REMAINS (WALL FOUNDATIONS, WELLS, PRIVIES, CISTERNS, ETC.) OR CONCENTRATIONS OF ARTIFACTS ARE DISCOVERED DURING DEVELOPMENT. WORK MUST CEASE IN THE AREA OF THE DISCOVERY UNTIL A CITY ARCHAEOLOGIST COMES TO THE SITE AND RECORDS THE FINDINGS. THE APPLICANT HAS COMPLETED A PHASE I ARCHEOLOGICAL SURVEY AND NO SIGNIFICANT ARTIFACTS WERE FOUND.

19. HVAC UNITS SHALL BE SCREENED WITH PLANTING MATERIALS. THE HVAC UNIT MAY ENCROACH INTO THE MINIMUM REQUIRED YARD IN ACCORDANCE WITH Z.O. SECTION 7-202(B)5.

20. THE APPLICANT WILL SUBMIT ALL REQUESTS FOR DRIVEWAY APRONS TO THE DEPARTMENT OF TRANSPORTATION AND ENVIRONMENTAL SERVICES.

21. THIS APPLICATION PROPOSES THE RESUBDIVISION OF LOTS 14-18 AND 21-24.

22. EXISTING IMPERVIOUS FEATURES/STRUCTURES SHALL BE REMOVED FROM THE RPA WITH MINIMAL DISTURBANCE.

23. THE APPLICANT WILL COORDINATE WITH VEPCO REGARDING THE PROPOSED CONSTRUCTION WITHIN THE EXISTING VEPCO EASEMENT. THE APPLICANT WILL PROVIDE DOCUMENTATION OF VEPCO'S APPROVAL AS PART OF THE FINAL DEVELOPMENT PLAN.

24. PORTIONS OF THE SUBJECT PROPERTY WERE PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT, THEREFORE ALL ENCUMBRANCES TO THE PROPERTY MAY NOT BE SHOWN.

25. EROSION & SEDIMENT CONTROL SHALL BE INSTALLED PRIOR TO ANY CLEARING, GRADING OR CONSTRUCTION AS PER THE REQUIREMENTS OF THE STATE OF VIRGINIA AND THE CITY OF ALEXANDRIA.

26. THE SITE SHALL BE SERVED BY PUBLIC WATER AND SEWER. THE EXISTING LATERALS MAY BE USED FOR THE PROPOSED DWELLINGS IF GRAVITY SERVICE IS PROVIDED. THE LOCATION AND ELEVATION SHALL BE CONFIRMED BY THE CONTRACTOR.

27. DEVELOPMENT OF THIS PROJECT SHALL COMMENCE AT SUCH TIME AS APPROPRIATE APPROVALS HAVE BEEN OBTAINED AND SUBJECT TO THE DISCRETION OF THE OWNER/DEVELOPER.

28. ALL PROPOSED UTILITIES SHALL BE UNDERGROUND. ALL UTILITY LOCATIONS ARE TO BE VERIFIED PRIOR TO CONSTRUCTION TO AVOID POTENTIAL CONFLICTS. THE CONTRACTOR WILL CONTACT THE ENGINEER OF RECORD AT 703-631-8387 IF ANY CONFLICTS ARISE.

29. THE SUBJECT PROPERTY IS LOCATED WITHIN THE STRAWBERRY RUN WATERSHED.

30. ALL PROPOSED DRIVEWAYS WILL CONTAIN CONCRETE RIBBON STRIPS AND PEA GRAVEL TO REDUCE IMPERVIOUS AREA.

CONSTRUCTION NOTES

1. THE EXISTING UNDERGROUND UTILITIES SHOWN HEREON ARE BASED UPON AVAILABLE INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL UTILITIES BEFORE COMMENCING WORK AND FOR ANY DAMAGES WHICH MAY OCCUR BY HIS FAILURE TO LOCATE OR PRESERVE THESE UNDERGROUND UTILITIES. IF DURING CONSTRUCTION OPERATIONS THE CONTRACTOR SHOULD ENCOUNTER UTILITIES OTHER THAN IN THOSE SHOWN ON THE PLANS, HE SHALL IMMEDIATELY NOTIFY THE ENGINEER AND TAKE NECESSARY AND PROPER STEPS TO PROTECT THE FACILITY AND ASSURE THE CONTINUANCE OF SERVICE.

2. THE CONTRACTOR SHALL DIG TEST PITS AS REQUIRED FOLLOWING NOTIFICATION AND MARKING OF ALL EXISTING UTILITIES TO VERIFY THE LOCATION AND DEPTH OF EXISTING UTILITIES TEST HOLES TO BE PERFORMED AT LEAST 30 DAYS PRIOR TO START OF CONSTRUCTION. ANY DISCREPANCIES ARE TO BE REPORTED IMMEDIATELY TO THE OWNER AND ENGINEER. REDESIGN AND APPROVAL BY REVIEWING AGENCIES SHALL BE OBTAINED IF REQUIRED.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE OWNER AND THE ENGINEER OF ANY CHANGES OR CONDITIONS ATTACHED TO PERMITS OBTAINED FROM ANY AUTHORITY ISSUING PERMITS.

4. THE CONTRACTOR SHALL VISIT THE SITE AND SHALL VERIFY EXISTING CONDITIONS PRIOR TO STARTING CONSTRUCTION.

5. THE CONTRACTOR SHALL CLEAR THE SITE OF ALL TREES, BUILDINGS, FOUNDATIONS, ETC. WITHIN THE LIMITS OF CONSTRUCTION UNLESS OTHERWISE SPECIFIED, AND SHALL BE RESPONSIBLE FOR CAUSING EXISTING UTILITIES TO BE DISCONNECTED.

6. THE DEVELOPER SHALL PROVIDE OVER-LOT GRADING TO PROVIDE POSITIVE DRAINAGE AND PRECLUDE PONDING OF WATER.

7. ALL AREAS, ON OR OFF-SITE, WHICH ARE DISTURBED BY THIS CONSTRUCTION AND WHICH ARE NOT PAVED OR BUILT UPON, SHALL BE ADEQUATELY STABILIZED TO CONTROL EROSION AND SEDIMENTATION. THE MINIMUM ACCEPTABLE STABILIZATION SHALL CONSIST OF PERMANENT GRASS, SEED MIXTURE TO BE AS RECOMMENDED BY THE COUNTY AGENT. ALL SLOPES 3:1 AND GREATER SHALL BE SODDED AND PEGGED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE CITY OF ALEXANDRIA.

8. EXISTING WELLS SHALL BE PERMANENTLY ABANDONED IN ACCORDANCE WITH VIRGINIA STATE WATER CONTROL BOARD REQUIREMENTS.

9. ALL OVER HEAD POLE LINES SHALL BE RELOCATED AS REQUIRED BY THE OWNING UTILITY COMPANIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING ALL ARRANGEMENTS AND COORDINATING ALL WORK REQUIRED FOR THE NECESSARY RELOCATIONS.

10. PRIOR TO BEGINNING CONSTRUCTION, CONTRACTOR SHALL VERIFY FROM THE ARCHITECTURAL DRAWINGS ALL DIMENSION, DETAILS, AND TREATMENTS FOR THE PROPOSED BUILDINGS, WALKWAYS, AND OTHER PROPOSED CONSTRUCTION WHERE INDICATED ON THE PLANS.

11. THE CONTRACTOR IS TO VERIFY INVERT, SIZE AND LOCATION OF BUILDING UTILITY CONNECTIONS WITH THE MECHANICAL PLANS PRIOR TO PLACEMENT OF UNDERGROUND UTILITIES.

12. EXISTING BUILDINGS, FENCES AND OTHER EXISTING PHYSICAL FEATURES ARE TO BE REMOVED AS REQUIRED BY THE CONTRACTOR.

13. EXISTING CONSTRUCTION SHALL BE REMOVED TO NEAREST JOINT. NEW CONSTRUCTION SHALL BE PROVIDED AS SHOWN AND ANY DAMAGED AREA SHALL BE REPAIRED TO MATCH CONDITIONS EXISTING PRIOR TO CONSTRUCTION.

14. DAMAGE TO ANY EXISTING ENTRANCES, CURB AND GUTTER, PAVEMENT OR OTHER EXISTING STRUCTURES NOT PROPOSED TO BE DISTURBED WITH THIS DEVELOPMENT , WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE REPAIRED TO THE SATISFACTION OF THE VIRGINIA DEPARTMENT OF TRANSPORTATION AND ANY ADJOINING OWNERS THAT MAY BE AFFECTED.

15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING A SMOOTH TRANSITION TO EXISTING CURB.

16. ALL PRIVATE BUILDING CONNECTIONS ARE TO BE INSTALLED IN ACCORDANCE WITH THE CURRENT PLUMBING CODE.

17. TOPS OF EXISTING STRUCTURES WHICH REMAIN IN USE ARE TO BE ADJUSTED IN ACCORDANCE WITH THE GRADING PLAN. ALL PROPOSED STRUCTURE TOP ELEVATIONS ARE TO BE VERIFIED BY THE CONTRACTOR WITH THE SITE GRADING PLANS. IN CASE OF CONFLICT, THE GRADING PLAN SHALL SUPERSEDE PROFILE ELEVATIONS. MINOR ADJUSTMENTS TO MEET FINISHED GRADE ELEVATIONS MAY BE REQUIRED.

18. THE DESIGN, CONSTRUCTION, FIELD PRACTICES AND METHODS SHALL CONFORM TO THE REQUIREMENTS SET FORTH BY THE CITY OF ALEXANDRIA AND ITS CURRENT ZONING ORDINANCE AND CONSTRUCTION STANDARDS MANUAL. FAILURE TO COMPLY WITH THE CODE, APPLICABLE MANUALS, PROVISIONS OF THE CONSTRUCTION AND ESCROW AGREEMENTS OR THE PERMITS SHALL BE DEEMED.

19. THE APPROVAL OF THESE PLANS SHALL IN NO WAY RELIEVE THE OWNER/DEVELOPER OR HIS AGENT OF ANY LEGAL RESPONSIBILITIES WHICH MAY BE REQUIRED BY THE CODE OF VIRGINIA OR ANY ORDINANCE ENACTED BY THE CITY OF ALEXANDRIA.

20. CONSTRUCTION STAKEOUT SHALL BE UNDER THE DIRECT SUPERVISION OF A LICENSED LAND SURVEYOR IN THE COMMONWEALTH OF VIRGINIA.

21. NO EVIDENCE OF GRAVES OR BURIAL SITES HAS BEEN FOUND ON THIS PROPERTY.

22. THE CONTRACTOR IS REFERRED TO STRUCTURAL, GEOTECHNICAL, MECHANICAL AND ARCHITECTURAL PLANS FOR FOUNDATION TREATMENT INCLUDING, BUT NOT LIMITED TO, SHEETING AND SHORING FOR BUILDING EXCAVATION. WATERPROOFING FOR FILL AGAINST BUILDINGS AND LOCATION OF MECHANICAL EQUIPMENT AND CONNECTIONS AT THE FACES OF BUILDINGS.

23. SMOOTH GRADE SHALL BE MAINTAINED FROM THE CENTERLINE OF EXISTING ROAD TO THE PROPOSED ENTRANCE AND/OR CURB & GUTTER TO PRECLUDE THE FORMING OF FALSE GUTTER AND/OR THE PONDING OF WATER ON THE ROADWAY.

24. PROPOSED PAVEMENT SECTION DEPTH(S) ARE BASED ON A CBR VALUE OF 10. LABORATORY TESTS OF SUBGRADE SOIL SHALL BE PERFORMED FOR ACTUAL DETERMINATION OF REQUIRED SUBGRADE THICKNESS PRIOR TO PAVING. IN THE CASE OF PAVEMENT PATCHES, PAVEMENT SECTION MUST MEET OR EXCEED EXISTING SECTION.

25. EMERGENCY VEHICLE EASEMENTS AND HANDICAPPED PARKING SPACES TO BE MARKED BY CITY OF ALEXANDRIA STANDARD SIGNAGE AND ADA REQUIREMENTS.

26. ALL STRIPING TO MEET MUTCD STANDARDS.

27. ALL EROSION CONTROLS SHALL CONFORM TO THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (THIRD ADDITION 1992) AND MUST BE SUBMITTED AND APPROVED BY T&ES.

28. ALL EMERGENCY VEHICLE EASEMENTS MUST BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH CITY STANDARDS (CSAP-1A).

29. ALL EARTHWORK OPERATIONS ARE TO BE PERFORMED UNDER THE FULL TIME, ON-SITE SUPERVISION OF A REGISTERED GEOTECHNICAL ENGINEER WITH GEOTECHNICAL TESTING IN ACCORDANCE WITH CONSTRUCTION SPECIFICATIONS AND SOILS REPORT REQUIREMENTS.

30. SOLID WASTE SHALL BE DELIVERED TO WASTE TO ENERGY FACILITY.

NOTES

THE CITY OF ALEXANDRIA DEPARTMENT OF TRANSPORTATION AND ENVIRONMENTAL SERVICES, DIVISION OF ENVIRONMENTAL QUALITY, MUST BE NOTIFIED IF UNUSUAL OR UNANTICIPATED CONTAMINATION OR UNDERGROUND STORAGE TANKS, DRUMS AND CONTAINERS ARE ENCOUNTERED AT THE SITE. IF THERE IS ANY DOUBT ABOUT PUBLIC SAFETY OR A RELEASE TO THE ENVIRONMENT, THE ALEXANDRIA FIRE DEPARTMENT MUST BE CONTACTED IMMEDIATELY BY CALLING 911. THE TANK OR CONTAINER'S REMOVAL, ITS CONTENTS, ANY SOIL CONTAMINATION AND RELEASE TO THE ENVIRONMENT WILL BE HANDLED IN ACCORDANCE WITH FEDERAL, STATE, AND CITY REGULATIONS.

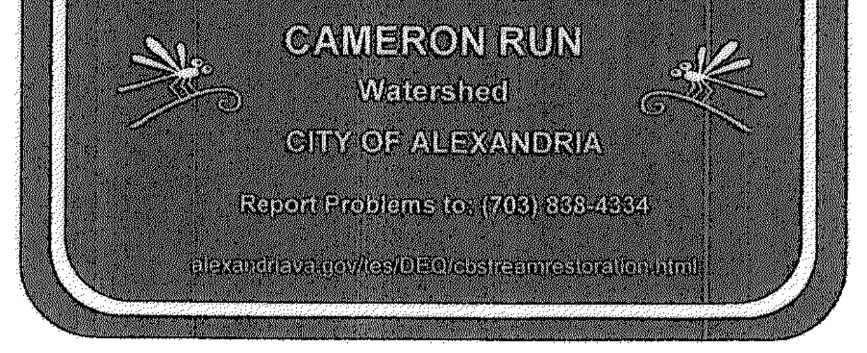
ALL WELLS TO BE DEMOLISHED ON THIS PROJECT, INCLUDING MONITORING WELLS, MUST BE CLOSED IN ACCORDANCE WITH STATE WELL REGULATION. CONTACT JOE FIANDER AND COORDINATE WITH THE ALEXANDRIA HEALTH DEPARTMENT AT 703-838-4400 EXT. 255.

ALL CONSTRUCTION ACTIVITIES MUST COMPLY WITH THE ALEXANDRIA NOISE CONTROL CODE TITLE 11, CHAPTER 5, WHICH PERMITS CONSTRUCTION ACTIVITIES TO OCCUR BETWEEN THE FOLLOWING HOURS:

MONDAY THROUGH FRIDAY FROM 7AM TO 6PM AND
SATURDAYS FROM 9AM TO 6PM
NO CONSTRUCTION ACTIVITIES ARE PERMITTED ON SUNDAYS.
PILE DRIVING IS FURTHER RESTRICTED TO THE FOLLOWING HOURS:
MONDAY THROUGH FRIDAY FROM 9AM TO 6PM
AND SATURDAYS FROM 10AM TO 4PM

BMP SIGN NOTES

THE BMP SIGN SHOWN BELOW WILL BE 12 X 18 INCHES.



GEOTECHNICAL NOTE

AS PER THE GEOTECHNICAL RECOMMENDATIONS PROVIDED BY TERRA ENGINEERING SERVICES, PLC, AND CERTIFIED BY TIMOTHY V. FARABAUGH, P.E., THE 2:1 CUT SLOPES PROPOSED IN THIS STREAM RETORATION PLAN ARE ADEQUATE AND PROVIDE NO SLOPE STABILITY CONCERNS, PROVIDED THE STREAMBANKS ARE STABILIZED IN ACCORDANCE WITH THE STREAM RESTORATION PLAN.

WQIA/RPA EXCEPTION LETTERS

DEPARTMENT OF TRANSPORTATION
AND ENVIRONMENTAL SERVICES
P. O. Box 178 – City Hall
Alexandria, Virginia 22313

alexandriava.gov

January 31, 2007

Jeffrey T. Hancock
Williamsburg Environmental Group, Inc.
5209 Center Street
Williamsburg, VA 23188

Dear Mr. Hancock:

The applicant, Taft Avenue Properties, DSP 2004-0038, has requested an administrative approval for encroachment into the RPA under Section 13-107(E)(1), Article XIII, environmental Management, which regulates development within the Resource Protection Area (RPA). This section of the Zoning Ordinance specifies:

"The following encroachments, if permitted in the underlying zone, are allowed to the RPA buffer area if approved by the Director of T&ES and provided that a water quality impact assessment is performed and accepted by the Director of T&ES as complete in accordance with Sec. 13-114.

(1) When the application of the buffer area would result in the loss of a buildable area on a lot or parcel recorded prior to October 1, 1989, encroachments into the buffer area may be approved by the Director of T&ES in accordance with the following criteria:

(a) Encroachments into the buffer area shall be the minimum necessary to achieve a reasonable buildable area for a principal structure and necessary utilities;

(b) Where practicable, a vegetated area that will maximize water quality protection, mitigate the effects of the buffer encroachment, and is equal to the area of encroachment into the buffer area shall be established elsewhere on the lot; and,

(c) The encroachment may not extend into the seaward 50 feet of the buffer area."

In this case, the proposal generally complies with the R-8 zone and is consistent with the City's Master Plan. Calculations of the proposed development show that 1,454 sq.ft. of impervious area will be constructed within the RPA, with a reduction in impervious area on each lot. Several housing layouts have been tried and the resulting configuration is the minimum encroachment necessary to achieve reasonable buildable area for principle structures and utilities. As required by the Zoning Ordinance, the applicant has provided a water quality impact assessment for review by T&ES. Significant mitigation is

proposed. The encroachment into the RPA will be at the edge of the RPA boundary (not within the seaward 50 feet) and the sheds currently existing in the rear of the lots that are close to the stream will be removed, thus eliminating the most near-stream encroachments into the RPA. Finally, the proposal complies with stormwater management requirements, largely due to the provision of a stream restoration plan.

This request therefore meets the requirements for administrative approval for encroachment into the RPA as listed in Article XIII, Section 13-107(E)(1) of the Alexandria Zoning Ordinance.

Sincerely,

Richard J. Baier, P.E.
Director, Department of Transportation and Environmental Services

Cc: Claudia Hamblin-Katnik, Watershed Program Administrator

OFFICE OF THE CITY MANAGER
301 King Street, Suite 3500
Alexandria, Virginia 22314-3211

RECEIVED MAR 1 6 2007 BY:

JAMES K. HARTMANN
City Manager

(703) 838-4300
Fax: (703) 838-6343

March 13, 2007

Kelly Atkinson
Land Design Consultants, Inc.
9401 Centreville Road, Suite 300
Manassas, Virginia 20110

Re: Letter of Permission for Stream Restoration in Fort Williams Park
Taft Avenue Project (DSP 2004-0038)

Dear Ms. Atkinson,

Thank you for your letter dated February 16, 2007 regarding the Taft Avenue project and your request for a letter of permission to perform stream restoration activities for Strawberry Run in Fort Williams Park. As indicated in your letter, your client, Calvert Homes, has proposed a stream restoration plan as part of the site plan for the Taft Avenue development that was approved at the Planning Commission on February 6, 2007. Considering the deteriorated state of this stream, the City agrees that the restoration will be of great benefit to the community. Therefore, the City grants you permission to perform work within the City-owned Fort Williams Park subject to the following conditions:

1. All work shall be performed in compliance with approved Site Plan (DSP 2004-0038) conditions.
2. The stream restoration plan shall be reviewed by the City as part of the Taft Avenue final site plan and work shall not begin in the stream and stream area until this plan has been approved and released.
3. A document illustrating access to and across public lands and other ground disturbance shall be approved by RP&CA, T&ES/DEQ, and P&Z prior to commencement of work.
4. RP&CA staff (City Arborist and Landscape Architect) shall field verify access routes, and other limits of ground disturbance in coordination with T&ES/DEQ and P&Z prior to commencement of work. Ten (10) calendar days notice is required to coordinate a field meeting.
5. All areas affected by work shall be restored to conditions as depicted in the restoration and landscape plans to the satisfaction of the RP&CA, T&ES/DEQ, and P&Z.
6. Per Condition of Approval #12, prior to any construction occurring in the stream and stream area, a community meeting shall be held with the applicable civic associations to discuss details of the plan and the implementation.

If you have any questions regarding this letter, please contact Katye Parker in the Planning and Zoning Department at (703) 838-4666 or katye.parker@alexandriava.gov.

Thank you for your cooperation on this project.

Sincerely,

James K. Hartmann
City Manager

cc: Ignacio Pessoa, City Attorney
Kirk Kincannon, Director, Recreation, Parks, and Cultural Activities
Roger Blakeley, Deputy Director, Park Operations and Capital Development, Recreation, Parks, and Cultural Activities
Rich Baier, Director, Transportation and Environmental Services
Bill Skrabak, Division Chief, Environmental Quality, Transportation and Environmental Services
Rich Josephson, Acting Director, Planning and Zoning
Katye Parker, Planner, Planning and Zoning

WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

CITY OF ALEXANDRIA NOTES AND DETAILS
TAFT AVENUE
CITY OF ALEXANDRIA, VIRGINIA

COMMONWEALTH OF VIRGINIA
JEFFREY T. HANCOCK
Lic. No. 37017
01/16/2008
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
5/25/06	ADDED STANDARD CITY OF ALEXANDRIA CONSTRUCTION NOTES
10/11/07	PER 9/17/07 CITY REVIEW LETTER
01/15/08	PER CITY COMMENT

DRAWN BY: EBG/MAM
DESIGNED BY: TWC/EBG/NJL
DATE: 12/27/05
CHECKED BY: TWC/JTH

SHEET: 12
JOB#: 2256

APPROVED
SPECIAL USE PERMIT NO. [illegible]
DEPARTMENT OF PLANNING & ZONING
DIRECTOR — DATE 2.4.08
DEPARTMENT OF TRANSPORTATION & ENVIRONMENTAL SERVICES
SITE PLAN NO. 2007-0018
DIRECTOR — DATE 2/1/08
CHAIRMAN, PLANNING COMMISION — DATE 2/4/08
DATE RECORDED
INSTRUMENT NO. DEED BOOK NO. PAGE NO.

V:\2200's\2256 - Taft\Stream Restoration\Construction Plans 10-10-07.dwg

APPENDIX B – STREAM RESTORATION AS-BUILT PLAN TAFT AVENUE PROPERTY

PROJECT NAME

TAFT AVENUE PROPERTY

AREA TABULATIONS

GENERAL NOTES

VICINITY MAP

SCALE: 1" = 250'

ENVIRONME ITAL SITE ASSESSMENT

WETLANDS ARE BEING DISTURBED ND WETLAND PERMITS ARE REQUIRED FOR THIS DEVELOPMENT. THERE ARE NO KNO N EX. UNDERGROUND STORAGE TANKS OR AREAS OF SOIL OR GROUNDWATER CONTAI INATION ON THE SITE.

PLA I SHEET KEY

EXISTING INTERMEDIATE CONTOUR	32	FLOW LINE	
EXISTING INDEX CONTOUR	30	FENCELINE	x
PROPOSED CONTOUR	20	EXISTING UTILITY POLE	
EXISTING EDGE OF PAVEMENT	EX. E/P	PROPOSED UTILITY POLE	
PROPOSED EDGE OF PAVEMENT	PROP. E/P	EXISTING WATERLINE W/ TEE	
EXISTING CURB AND GUTTER	EX. C & G	PROPOSED WATERLINE W/ TEE	
PROPOSED CURB AND GUTTER	CG-6	EXISTING FIRE HYDRANT	
TRANSITION FROM CG-6 TO CG-6R	CG-6 CG6R	PROPOSED FIRE HYDRANT	
EXISTING TELEPHONE LINE	T	EXISTING WATER VALVE	
PROPOSED TELEPHONE LINE	T	PROPOSED WATER VALVE	
EXISTING STORM SEWER	EX. (15") RCP	PROPOSED WATER METER	
PROPOSED STORM SEWER	PROP. (15") RCP	EXISTING REDUCER	
EXISTING SANITARY SEWER		PROPOSED REDUC	
PROPOSED SANITARY SEWER		STOP SIGN	
EXISTING ELECTRIC SERVICE	E	HANDICAP RAMP (:-12) DENOTES LOCATION O ID VDOT CG-12 AND/OR JURI TIONAL STANDARD RAMP CON UCTION	
PROPOSED ELECTRIC SERVICE	E	PARKING INDICAT INDICATES THE NUME OF TYPICAL PARKING SPACES	12
EXISTING GAS LINE	G	TEST PIT LOCATION	
PROPOSED GAS LINE	G	CRITICAL SLOPE SLOPES TO BE STABILIZED PURSUANT TO VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK	
PROPERTY LINE		VEHICLES PER DAY COUNT	100
EASEMENT LINE		PROPOSED BUILDING ENTRANCE	
CENTERLINE		EXISTING STREET LIGHT	
LIMITS OF CLEARING AND GRADING		PROPOSED STREET LIGHT	
EXISTING SPOT ELEVATION	12.0	PROPOSED STREET NAME SIGN	
PROPOSED SPOT ELEVATION	12.5	PROPOSED SANITARY LATERAL CLEANOUT	
EXISTING TREE DRIP LINE		SANITARY MANHOLE INDENTIFIER	12
EXISTING TREE	375 mm (15") OAK	STORM DRAIN STRUCTURE IDENTIFIER	18
PROPOSED TREE	OAK		

CERTIFIED LAND DISTURBER

I, JOHN K. RINGLE WILL HEREBY SERVE AS THE CERTIFIED LAND DISTURBER FOR THE ENCLOSED PROJECT.

TOTAL DISTURBED AREA = 3.48 AC

SIGNATURE DATE 10466 LICENSE NUMBER

ZONING TABULATIONS

1. ZONE OF SITE: R-8 (BY-RIGHT)
2. USE: EXISTING: RESIDENTIAL (S.F.D)
   PROPOSED: RESIDENTIAL (S.F.D)
3. LOT AREA: SEE SHEET 2A
   MINIMUM LOT AREA: 8,000 SF
4. NUMBER OF DWELLING UNITS: 13
5. UNITS PER ACRE (DENSITY): 13 UNITS/2.70 = 4.81 D.U./AC
6. GROSS SQUARE FOOTAGE: SEE SHEET 2A.
7. NET SQUARE FOOTAGE: SEE SHEET 2A.
8. FLOOR AREA RATIO: SEE SHEET 2A (Z.O. SECTION 3-306(B))
9. OPEN SPACE: SEE SHEET 7
10. AVERAGE FINISHED GRADE: SEE SHEET 2A.
11. HEIGHT: SEE SHEET 2A.
    MAX. ALLOWABLE HEIGHT = 35'
12. YARDS: SEE SHEET 2A.
13. FRONTAGE:
    REQUIRED: 40' MIN. AT FRONT LINE
    PROVIDED: 40' MIN. AT FRONT LINE
14. PARKING SPACES: 2 SPACES PER DWELLING UNIT
    EXISTING: 26 (2 SP/UNIT, IN GARAGE)
    PROPOSED: 26 (2 SP/UNIT, IN GARAGE)
15. LOADING SPACES: N/A
16. TRIP GENERATION (VPD):
    EXISTING: 130
    PROPOSED: 130
17. WATERSHED: STRAWBERRY RUN

SHEET INDEX

DEVELOPER/OWNER
CALVERT HOMES, INC.
12656-C LAKE RIDGE DRIVE
LAKE RIDGE, VA 22192
PH NO.: (703) 643-5001

OW NER
TAFT S TREET, L.C.
12656-C LAKE RIDGE DR VE
LAKE R DGE, VA 22192
PH NO. (703) 643-5001

OWNER
TAFT AVENUE, L C.
12656-C LAKE RI GE DRIVE
LAKE RIDGE, VA 22192
PH NO.: (703) 643-5001

ENGINEER
LAND DESIGN CONSULTANTS
9401 CENTREVILLE ROAD,
SUITE 300
MANASSAS, VA 20110
PH NO.: (703) 257-5600
CONTACT: KELLY ATKINSON/
JOSH MARSHALL, P.E.

ARCHITECT:
RDG GROUP
12792 HARBOR DRIVE,
LAKE RIDGE, VA 22192
PH NO.: (703) 490-0408

ARCHITECT:
GARY M. ZICKAFOOSE
5830 BETHEL ROAD
ALEXANDRIA, VA 22310
PH NO.: (703) 960-5245

DSP2007-00018

APPROVED ASBUILT
DEVELOPMENT SITE PLAN NO. ~~2004-0037~~
DEPARTMENT OF TRANSPORTATION & ENVIRONMENTAL SERVICES
DIRECTOR 10/4/11 DATE
SPECIAL USE PERMIT

DESIGN ENGINEER / SURVEYOR
FIRM NAME: LAND DESIGN CONSULTANTS
ADDRESS: 9401 CENTREVILLE ROAD, SUITE 300
MANASSAS, VIRGINIA 20110
PHONE NO.: 703-257-5600 FAX NO.: 703-257-5666
PROJ. MANAGER: JOSH MARSHALL EMAIL: josh@ldc-va.com

SEAL:
I HEREBY CERTIFY THAT OTHER THAN THE REVISIONS SHOWN HEREON, NO OTHER CHANGES HAVE BEEN MADE.

COMMONWEALTH OF VIRGINIA
8-24-10
KEVIN D. VAUGHN
Lic. No. 1508
LAND SURVEYOR

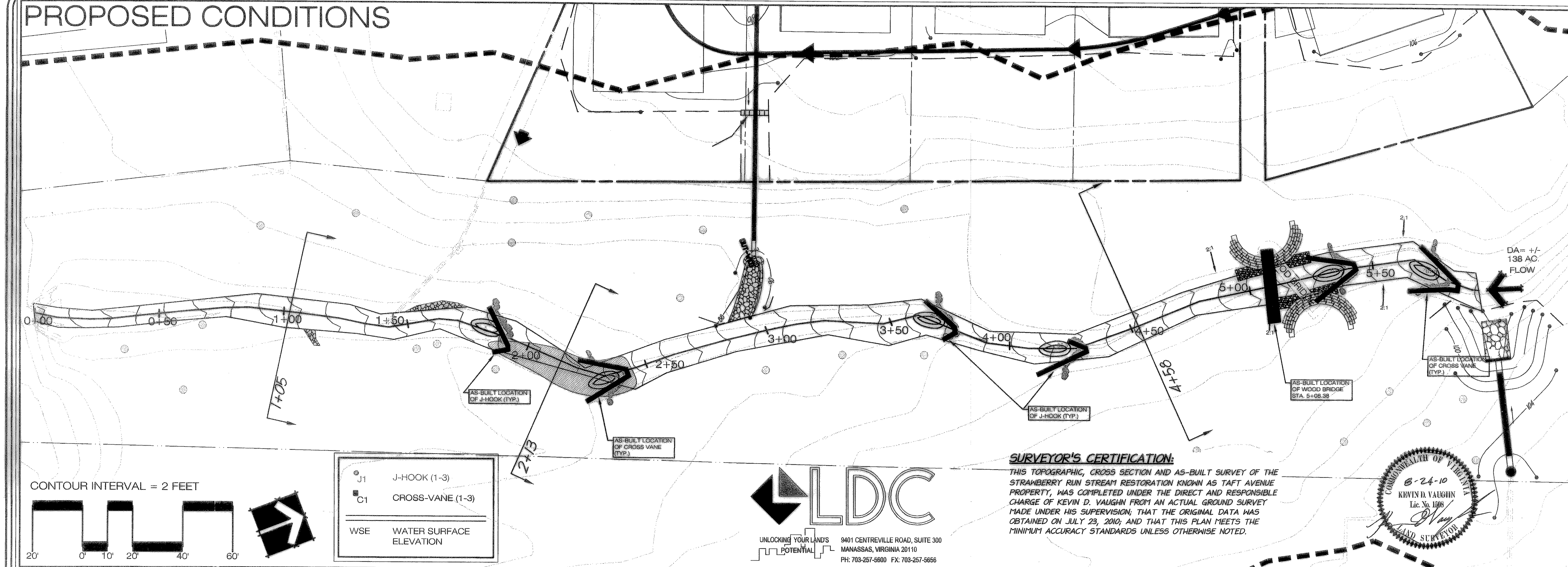
REVISION APPROVED BY DATE

DRAWN BY: DATE: MARCH 30, 7
SCALE: N/A

STREAM RESTORATION AS-BUILT
TAFT AVENUE PROPERTY
CITY OF ALEXANDRIA, VIRGINIA
SHEET NAME: COVER SHEET

APPROVED
SPECIAL USE PERMIT NO.
DEPARTMENT OF PLANNING & ZONING
DIRECTOR DATE
DEPARTMENT OF TRANSPORTATION & ENVIRONMENTAL SERVICES
SITE PLAN No. 2004-0038
DIRECTOR DATE
CHAIRMAN, PLANNING COMMISSION DATE
DATE RECORDED
INSTRUMENT NO. DEED BOOK NO. PAGE NO.

PROPOSED CONDITIONS



Symbol	Description
J1	J-HOOK (1-3)
C1	CROSS-VANE (1-3)
WSE	WATER SURFACE ELEVATION

LDC

UNLOCKING YOUR LAND'S POTENTIAL

9401 CENTREVILLE ROAD, SUITE 300
MANASSAS, VIRGINIA 20110
PH: 703-257-5600 FX: 703-257-5656

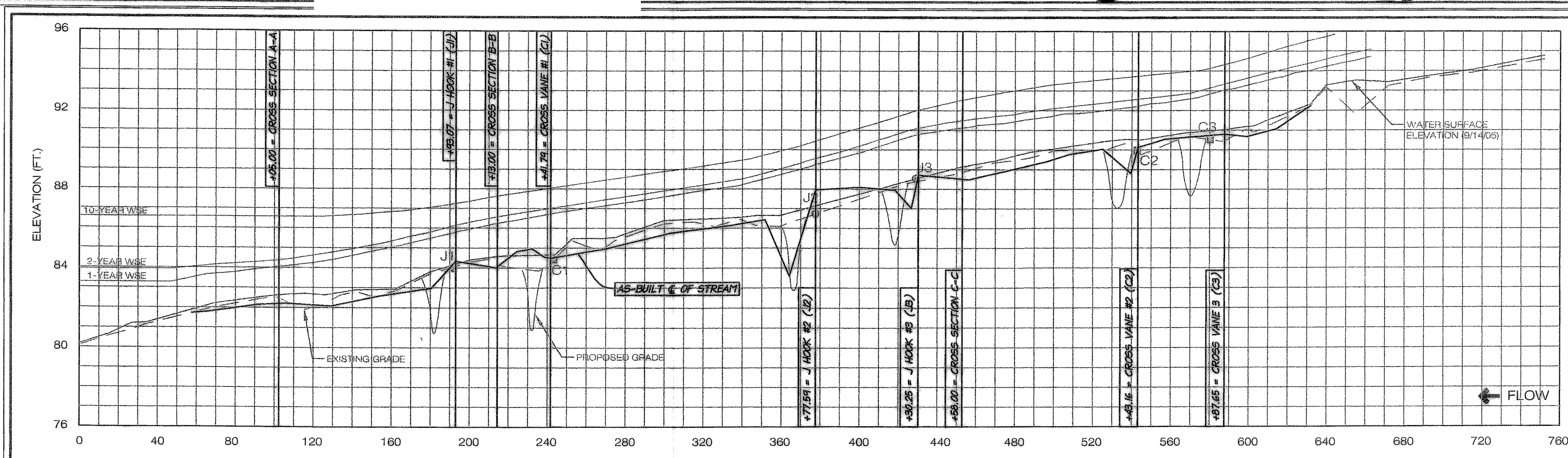
SURVEYOR'S CERTIFICATION:

THIS TOPOGRAPHIC, CROSS SECTION AND AS-BUILT SURVEY OF THE STRAWBERRY RUN STREAM RESTORATION KNOWN AS TAFT AVENUE PROPERTY, WAS COMPLETED UNDER THE DIRECT AND RESPONSIBLE CHARGE OF KEVIN D. VAUGHN FROM AN ACTUAL GROUND SURVEY MADE UNDER HIS SUPERVISION; THAT THE ORIGINAL DATA WAS OBTAINED ON JULY 23, 2010; AND THAT THIS PLAN MEETS THE MINIMUM ACCURACY STANDARDS UNLESS OTHERWISE NOTED.

COMMONWEALTH OF VIRGINIA
KEVIN D. VAUGHN
Lic. No. 1508
LAND SURVEYOR
8-24-10

LEGEND:

- PROJECT LIMITS
- APPROXIMATE STREAM CHANNEL LIMITS
- RESOURCE PROTECTION AREA LIMITS
- EXISTING CONTOURS
- EXISTING TREES (TO BE PROTECTED)
- EXISTING TREES (TO BE REMOVED)
- PROPOSED CROSS-VANE
- PROPOSED J-HOOK
- PROPOSED SCOUR POOL
- PROPOSED BUFFER RESTORATION AREA
- PROPOSED BANKFULL BENCH AND BANK GRADING
- PROPOSED GRADING FOR STORMWATER OUTFALL (BY OTHERS)
- UN-SURVEYED CROSS-SECTION
- SURVEYED CROSS-SECTION
- PROPOSED ROCK STABILIZATION
- PROPOSED OUTLET PROTECTION
- PROPOSED CHANNEL SHAPING
- PROPOSED BRIDGE STABILIZATION



SCALE: HORIZONTAL 1 INCH = 40 FEET, VERTICAL 1 INCH = 4 FEET

DSP2007-00018

APPROVED ASBUILT

DEVELOPMENT SITE PLAN NO. ____________

DEPARTMENT OF TRANSPORTATION & ENVIRONMENTAL SERVICES

DIRECTOR DATE 10/6/11

SPECIAL USE PERMIT ____________

PROPOSED DESIGN GUIDELINES

THE PROPOSED DESIGN SHALL MIMIC, TO THE CLOSEST EXTENT PRACTICABLE, THE "C" CHANNEL PARAMETERS OUTLINED BY THE ROSGEN CLASSIFICATION METHOD. THE PARAMETERS INCLUDE ENTRENCHMENT RATIO, WIDTH/DEPTH RATIO, SINUOSITY, AND SLOPE. AN AVERAGE OF EXISTING CONDITIONS AND PROPOSED CONDITIONS IS PRESENTED BELOW.

	ENTRENCHMENT RATIO	WIDTH/DEPTH RATIO	SINUOSITY	SLOPE
"C" CHANNEL GUIDELINES	>2.2	>12	>1.2	<.02
EXISTING CONDITION	1.5 - >2.2	10.6*	1.03	.02
PROPOSED CONDITION	1.9 - >2.2	16.5*	1.03	.02

* WIDTH-DEPTH RATIO CALCULATED AS TOP WIDTH DIVIDED BY AVERAGE DEPTH

PROPOSED RESTORATION SUMMARY

THE PROPOSED RESTORATION WITHIN STRAWBERRY RUN COMBINES IN-STREAM STRUCTURES WITH CHANNEL SHAPING AND BANK STABILIZATION TECHNIQUES. EXISTING CONCRETE DEBRIS WILL BE REMOVED FROM THE STREAM BED AND BANKS IN ORDER TO RESTORE NATURAL FLOW DYNAMICS. IN-STREAM STRUCTURES, INCLUDING J-HOOKS, AND CROSS-VANES, SHALL PROVIDE GRADE CONTROL AND DIVERT EROSIVE FLOWS FROM OUTER BENDS. OUTLET PROTECTION AT THE PROPOSED 18" CMP WILL ATTENUATE STORMWATER FLOWS AND PREVENT FURTHER DEGRADATION OF THE DOWNSTREAM STREAM BANKS. ROCK-TOE PROTECTION WILL PROTECT THE CONFLUENCE OF THE CHANNEL AND AN EXISTING DRAINAGE SWALE, IN ADDITION TO STABILIZING HIGH STRESS AREAS. BANKFULL BENCHES SHALL PROVIDE SLOPE STABILIZATION IN EXISTING ERODED AREAS, WHERE PRACTICABLE, IN ADDITION TO ENHANCING CONNECTIVITY TO THE FLOODPLAIN. THE EXISTING WOOD FOOT BRIDGE WILL BE RETAINED AND ENHANCED WITH A PROPOSED CONCRETE FOUNDATION. PROPOSED ROCK STABILIZATION, ROCK-TOE PROTECTION, AND CEMENT GROUTED RIPRAP WILL PROTECT THE EXISTING VERTICAL BANKS NEAR THE BRIDGE DURING HIGH FLOW EVENTS.

THE RESTORATION PLAN ALSO INCORPORATES APPROXIMATELY 1.3 ACRES OF RIPARIAN CORRIDOR RESTORATION. NON-NATIVE VEGETATION (E.G., BAMBOO) SHALL BE MANAGED AND NATIVE VEGETATION SHALL BE USED TO RESTORE THE RIPARIAN BUFFER. IMPACTS TO EXISTING MATURE TREES SHALL BE AVOIDED AND MINIMIZED. TREES, SHRUBS, LIVE-STAKES, AND A HERBACEOUS SEED MIX SHALL PROVIDE AN EFFECTIVE ROOTING DEPTH TO STABILIZE THE GRADED BANKS.

LDC FILE LOCATION: P:\PY 2004\04126-1-0 City of Alexandria\ENG\SUBPLAN\Stream Rest-Asbuilt\stream restoration - WEG-asbuilt.dwg

WILLIAMSBURG ENVIRONMENTAL GROUP, INC.

STREAM RESTORATION AS-BUILT
TAFT AVENUE PROPERTY
CITY OF ALEXANDRIA, VIRGINIA

COMMONWEALTH OF VIRGINIA
JEFFREY L. HANCOCK
Lic. No. 37017
PROFESSIONAL ENGINEER

REVISIONS:

DRAWN BY: EBG/MAM
DESIGNED BY: TWC/EBG/NJL
DATE: 12/27/05
CHECKED BY: TWC/JTH

SHEET: 2

JOB#: 2256

APPROVED
SPECIAL USE PERMIT NO. ____
DEPARTMENT OF PLANNING & ZONING
DIRECTOR ____ DATE ____
DEPARTMENT OF TRANSPORTATION & ENVIRONMENTAL SERVICES
SITE PLAN NO. 2007-0018
DIRECTOR ____ DATE ____
CHAIRMAN, PLANNING COMMISSION ____ DATE ____
DATE RECORDED ____
INSTRUMENT NO. ____ DEED BOOK NO. ____ PAGE NO. ____